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MILITARY PORTABLE WIRELESS TELEPHONES.

By FRANK C. PERKINS.

PORTABLE Radio Wireless Telephones have been devised for use in the army, a storage battery being employed for supplying the current for operating the instruments over considerable distances. The accompanying illustration, Fig. 1, shows a portable sparkless Radio Telephone outfit for field use, installed in an automobile. This apparatus without visible antennæ has a range of two miles, and with a field antennæ attachment easily operates at twenty miles. It is provided with the necessary current from a high power storage battery, which is good for ten hours of constant service.

Instead of transporting the wireless instrument in an automobile, it may be carried on the back of a mule, as indicated in the next illustration. This apparatus is very compact and light, being especially designed for field and military work and, it is said, will be thoroughly tested under most severe conditions by the United States Army. As shown in the cut, a sparkless telephone message is being sent over a mile without the use of visible antennæ.

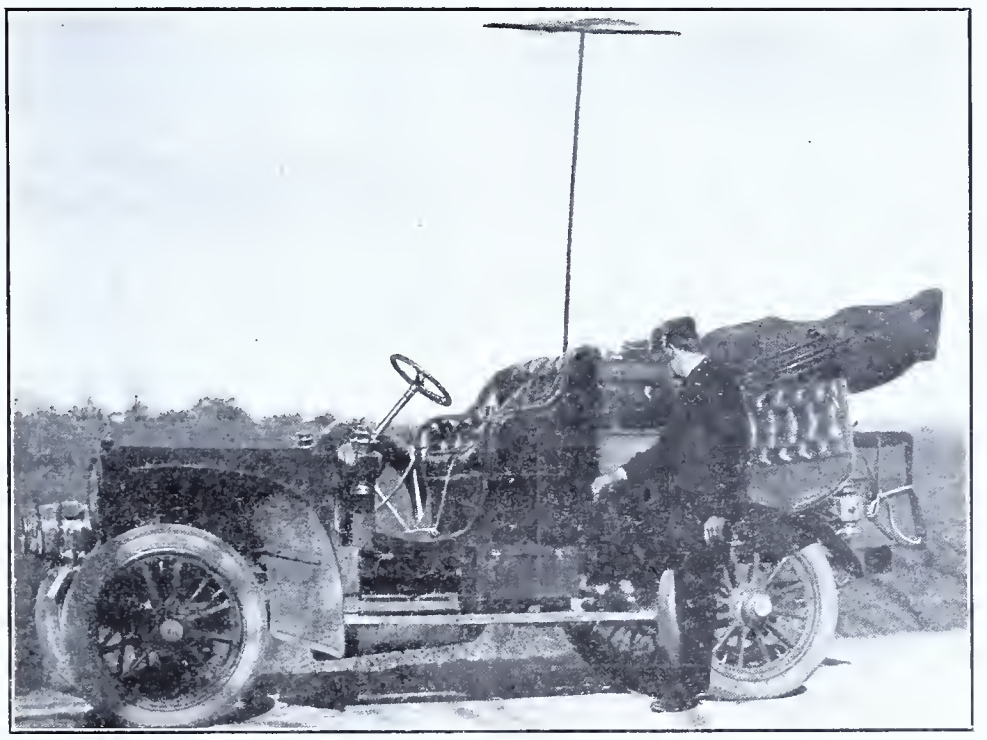


FIG. 1.—WIRELESS TELEPHONE IN AN AUTOMOBLE.

The mechanical principles upon which the aerophone depends seem to be simple enough, although there is some difference of opinion regarding the theory. It may be stated that speech is the formation of a complex and ever varying series of vibrations. Aerophony is the transformation of these vibrations into electrical oscillations which in turn cause the ether to oscillate. This is accomplished when an arc with carbon copper electrodes is operated on a 250 volt direct current. An induction coil is connected to the carbon electrode and to a condenser, and the condenser to the carbon electrode, thus shunting the arc. This shunt circuit causes an alternating current in the arc which, in passing through the induction coil,

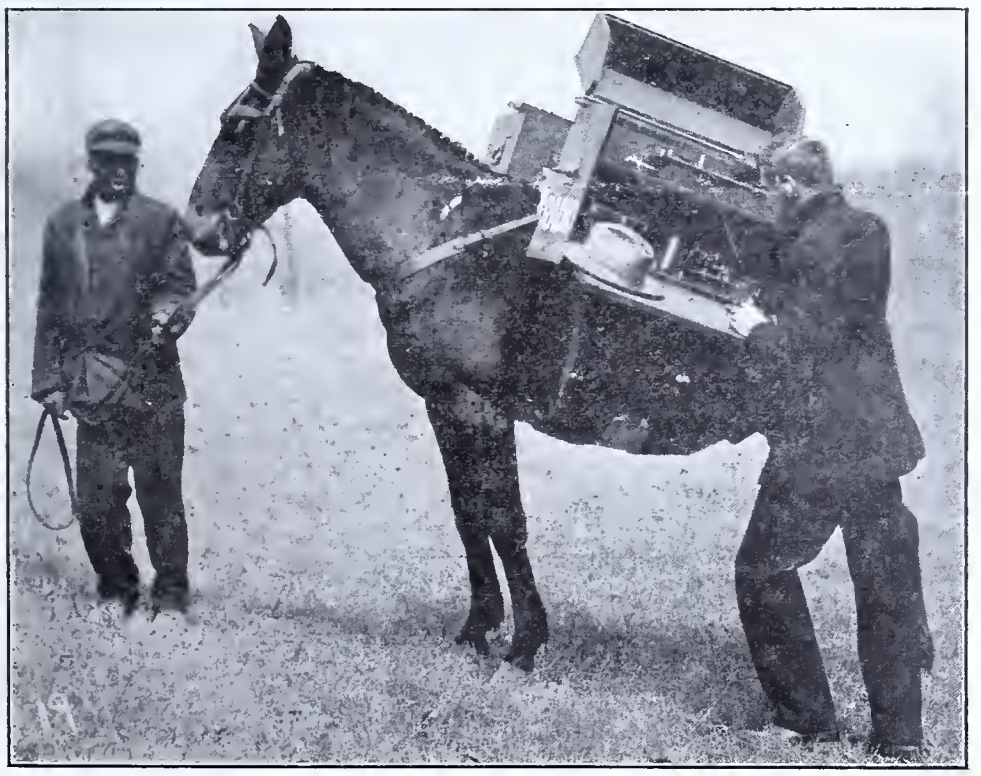


FIG. 2.—STORAGE BATTERY AND WIRELESS APPARATUS CARRIED BY MULE.

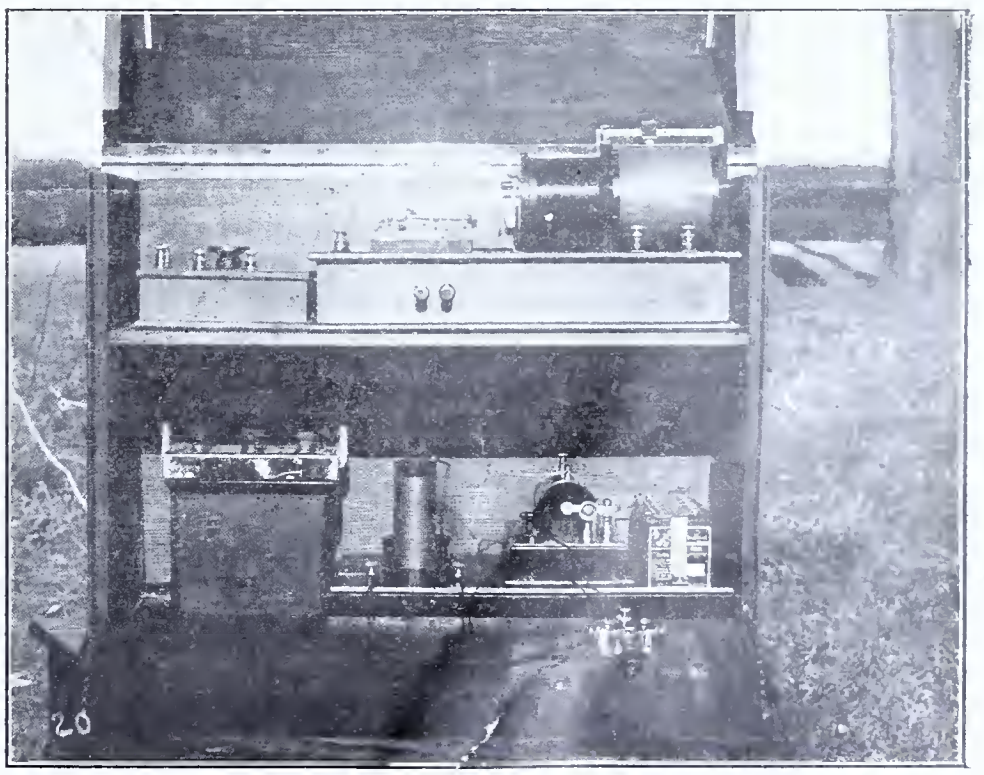


FIG. 3.—STORAGE BATTERY AND WIRELESS APPARATUS IN OPERATION.

produces a current in the secondary winding of the same. This secondary winding is connected to suitable antennæ, and to the ground through a telephone transmitter. Words spoken into the transmitter vary the resistance of the circuit, thereby causing etheric oscillations to be set up, which may in turn be received upon antennæ located some distance away, and by means of suitable instruments retransformed into intelligible speech.

Quarrying Slate.

Slate is used for many purposes besides roofs and school work. The walls of houses, stairways, floors, chimney tops, door and window sills, sidewalks, fence posts, bathtubs, mantlepieces, blackboards and many other objects are made from this useful material. It is not generally known that it can be sawed and worked so accurately that bath tubs and cisterns are made perfectly water tight, simply by joining the edges of the slate blocks. Pennsylvania is the state from which our main supplies of slate are drawn. It is gotten out of the ground by means of blasting, holes having been bored into it with steam drills. With the aid of derricks and hoisting chains, the rough slabs are raised to the edges of the quarry, and are then rolled on trucks to a building where they are to be split. The slate forms naturally in layers, and the splitter following the grain with a large chisel, separates the blocks into the proper thicknesses for roofing slate.

The substance then passes through a cutting or trimming machine, where the blows of a heavy knife cut the irregular pieces into rectangular "shingles." The slates are then piled up in squares, each pile containing enough to cover 100 square feet of roof.

A factory in Pennsylvania where various articles are manufactured from slate contains three horizontal saws 12 feet in length. each of which is furnished with 75 cutting diamonds. Probably these are the most expensive saws in the world; for each one costs $5,300. There are also in the factory diamond jigsaws, a circular saw, four planers, and other slate working machinery. The huge horizontal saw that works on a block of slate is lowered by a ratchet at the rate of a quarter of an inch a minute. The saw would cut iron or steel at the same rate. Water is played on the saw to keep it cool and wash the slate dust from the cut. After the sawing, the block is planed by being moved back and forth by machinery, under a chisel. Then it is polished by a rapidly revolving disk of cast iron covered with sand. The slate is bored by means of diamond pointed drills.

SNOW FIGHTING EQUIPMENT ON STREET CARS.

One of the greatest difficulties experienced by street car companies in northern climates, is the formation of ice in the center of the track and the necessity of frequently clearing away the snow. Special equipment must be provided to keep the system open and operating through all sorts of weather. Snow plows are as old as street cars, but an attachment to the passenger cars themselves is often to be found necessary. The ice formation also presents a serious problem, as in some places it is so bad that traction cannot be obtained with the wheels, the motors riding so heavily on the ice centers that the whole weight of the car is lifted from the wheels. In trying to overcome these difficulties, a double truck car is employed, provided with a right angle nose plow constructed of steel plate one-eighth of an inch thick and twelve inches wide, strengthened at the bottom by a one-half inch bar of steel.

The plow is mounted under the vestibule, by bolting it to vertical standards with loose fitting cleats of iron, allowing the car to oscillate or rock at will, the plow sliding up and down the standards, and no jar being felt in the car. By placing in the vestibule an ordinary brake staff, at the bottom of which is attached a chain running over a small pulley connected to the plow, the plow on the rear end of the car is raised and prevented from drawing in snow.

On account of the sharp grades in some cities, it is necessary to arrange the plows to be raised and lowered. Angle iron guides, set parallel to each other, are attached vertically to the angle iron bumper. Arranged to slide up and down in these guides are bars of square iron attached firmly to the top and bottom of the plows. The nose is moved by a worm gear contrivance. The worm engages a gear keyed to another 1½ inch shaft, extending horizontally to the front of the car through a small bearing attached to the bumper. Keyed to the outer end of this shaft is a small pulley with a chain attached, the other end of the chain being attached to the plow. When running on ordinary track the plow is run down near the rail, but when necessary, it can be lifted about nine inches. Triangular extension wings (see cut) are provided for use on the ends of the nose. These are pivoted by a bolt at one corner, so that the motorman can move them in or out, as he wishes. In fair weather, the plow is raised and the wings turned in.

This apparatus has been found to render most efficient service, clearing the road even better than a regular snow plow and saving much time. It can be made to operate faster than the old time snow plow, and throws the snow 10 or 12 feet from the track.

Artificial Sapphires.

The production of artificial diamonds has long been a dream of science, and of late years it has been realized, though not on a commercial basis. Rubies, however, can be made that defy the most expert analysis to distinguish from the genuine products of nature, and the latest is the artificial manufacture of sapphires. The process is much the same as that followed in making rubies. A quantity of clay and oxide colorant are the only ingredients used, and the greatest care must be employed, as the least fraction too much of either would cause a failure. The secret lies in the kind of clay used, and the quantity to be mixed. After it has been weighed, it is placed in crucibles of refractory earth, which are deposited in a furnace heated by oxy-hydrogen. The crucible, placed in a heavy oil, remains in the furnace for several hours, at a temperature of about 3,000 degrees F. When withdrawn, the contents of the crucible with a little more of the powder are placed in a cartridge-like receptacle, sealed up, and submitted to the heat of the specially designed oxy-hydrogen blow pipe furnace. The powder drops from the supported jar through a funnel to the heated point of the blow pipe, and as it falls, the drop is formed by contact with the free air into a beautiful and translucent sapphire. It is then ready for cutting, which is done in the usual way, and can be placed on the market at a net profit of about $4.75 a carat.

The Slot Typewriter.

Drop a nickel in the slot and get a typewriter. This is the latest convenience to be offered at the leading hotels, on steamers, trains, etc. The machine is wheeled into your room on a table of the usual type, provided with rollers. It is provided with a locking attachment which prevents its operation until released by the magic nickel. When you want to use it, you drop the coin in the slot, and it is at your service for half an hour, at the end of which period it automatically locks up again. Another nickel gives you the use of it for a second half hour, and so on.

A THERMAL CLOCK.

By FRANK C. PERKINS.

A novel form of thermal clock, as constructed at Lisieux, France, is shown in the accompanying illustration. This clock has a reservoir containing alcohol, which feeds a small lamp, shown at the left in the illustration. The flame from this alcohol lamp heats a cone which is connected by a tube pivoted at the center to a second cone. This tube with the cones at the end has a rocking movement, which by means of a small chain imparts motion to a large wheel in the clock.

In operating, the cone at the left being in the lower position becomes heated by the lamp and in about seven seconds rises suddenly, the cone at the right dropping onto the support. A small chain at the left raises the metal cover or sector over the lamp until the left one cools (which takes place in about seven seconds) when it descends. When the left cone drops the cover is removed from the lamp,

the cone is again heated and the movement is repeated. A small adjusting screw at the left regulates the height of the flame and causes the movement to be fast or slow as desired. It is stated that the reservoir once filled will operate the clock for a month without attention.

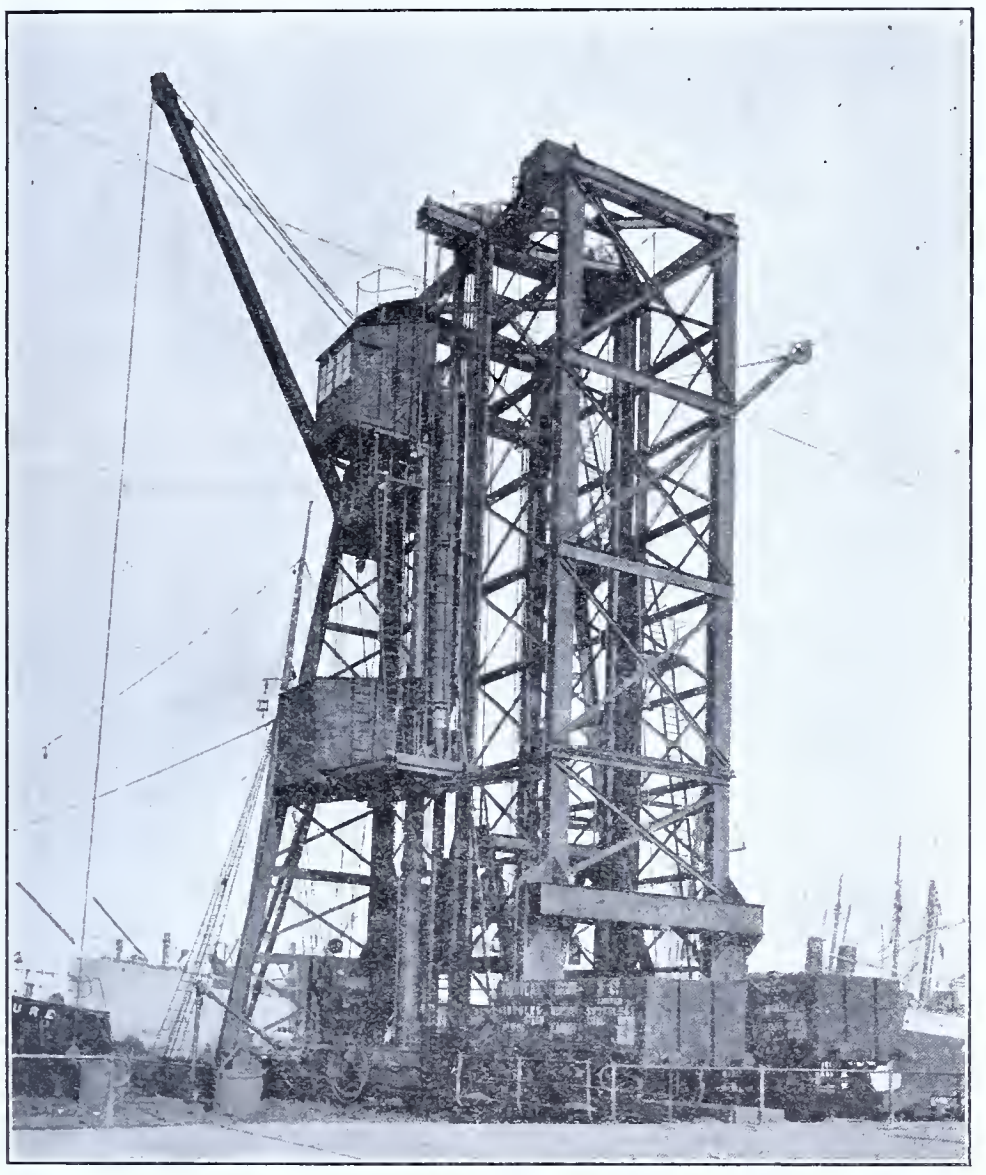
New Pay-as-You-Enter Car.

A new type of the pay-as-you-enter car has been tried with success in Pittsburg. Platforms are entirely eliminated in this structure, and a narrow corridor, running along one side of the car for one-third of its length, takes the place of the rear platform. From the rear steps the passengers enter this corridor and walk to its end, where the conductor stands collecting fares. Just beyond the conductors' stall in the center of the car is the exit. Passengers cannot enter the car through this door nor leave by the entrance door at the rear, thus doing away with considerable congestion.

MOVABLE HYDRAULIC COAL HOIST.

By C. VAN LANGENDONCK.

THE hoist herewith illustrated is designed to accommodate 20-ton wagons, but provision has been made in the hydraulic cylinders to enable wagons up to 30 tons gross to be dealt with, if required. The total lift is 50 feet from rail level. The hoisting and balancing cylinders are placed on the right-hand side—looking from the dock. Both rams are connected to the same crosshead, carrying two hoisting rope sheaves, and two tipping rope sheaves, the hoisting rope multiplying two to one, and the tipping rope sheaves taking up the rope as the cradle rises. The hoisting ropes are anchored to the cylinder, then down under the sheaves, up to the top guide



MOVABLE HYDRAULIC COAL HOIST FOR NEWPORT (ENGLAND) DOCKS.

sheaves, and down to both sides of the cradle beam. The tipping cylinder is fixed to the outside of the hoisting cylinder, with the ram working upwards; the ropes are attached to the ramhead, then carried under the sheaves provided on the hoisting ram crosshead, then up to the top guide sheaves, and down to the back end of cradle kicker, where they are secured to right and left-hand adjusting screws. The traverser for taking the trucks to and from the hoist has a travel of 200 feet, which enables the hoist to be worked at any point within that range. The traversers are moved by hydraulic cylinders at either end of the travel, with multiplying sheaves and wire ropes attached to the traverser. The traverser with loaded truck is first placed with "full kicker" opposite the full "running on" line of rails. It is then drawn to the hoist, where the full wagon is run on to the hoist cradle by means of a hydraulic ram at the back of the kicker. The ram is operated by displacing the water, which is in another cylinder placed at the end of the traverser nearest the hoist. This ram is fixed horizontally, with its end just flush with the side of traverser when the kicker is down, having been driven out by the weight of the kicker displacing the water (or oil) from the kicking cylinder. The fluid in these cylinders, in working backwards and forwards from one cylinder to the other, is operated by a horizontal ram on the main hoist frame, which is worked by the man on the cradle. While the truck is being lifted, the traverser is moved to bring the empty kicker opposite the descending cradle rails, and the empty truck is run on to the kicker by the falling hoist kicker, the rails of which have sufficient rise at the front end to start the empty truck.

The traverser is now drawn back to the "full" and "empty" roads, which have a fixed position. The empty truck is run off the kicker by a ram in the quay ground, and another full truck is run on the kicker, ready to repeat the foregoing operations.

The movements of the traversers are operated by means of a suitable hand-wheel fitted with grooved pulleys and wire rope connection with the operating valve, which is fixed in the cylinder tench at one end of the travel, and can be automatically stopped at any position.

All movements: lifting, tipping, hoisting and slewing the 3 ton and 5 ton anti-breakage cranes, are under the control of the man in the elevated cabin at the right-hand side of the hoist, looking from the dock.

The butt of the chute is lifted or lowered in the usual way by means of the main cradle, and is held is held in the proper position by two strong chains on each side, suspended from the top of the hoist framing. The point of the chute is moved by means of a wire rope which passes up to the top of the hoist, and thence down to a powerful crab winch, actuated by a 3 cylinder hydraulic engine, strong brakes being fitted for lowering the points. The chute, when working, is capable of reaching a distance of 22 feet from the face of the quay, and is provided near the points with screening bars and doors for double screening. The hydraulic engine which operates the chute point also acts on 3 of the 6 pointing wheels, which are of steel, two of these being on the quay, and one on the wharf side. The movements are manipulated by the cradle attendant. All of the valves, ports and pipe areas, are designed to give the greatest practical speed in working. Rope pulleys of special construction are used throughout, with greenheart segments forming the bottom of the groove.

Commercial Air Ship.

At the ship yard of Lewis Nixon, the well known engineer and ship builder, on Staten Island, work has been begun on the first real passenger carrying air ship in the world's history. Before the end of the year, say its projectors, a vast craft of glistening steel, more than 1,000 leet long, with accomodations for 100 persons, will arise above the sky scrapers of New York, ready for actual use.

There have been dirigible machines since, in 1883, Gaston Tissandier succeeded in steering for a few minutes a cigar-shaped gas bag. From his time to the nerve-shattering exploits of Santos Dumont and the more satisfying performances of Count Zeppelin, aeronauts have sought to devise an airshipcapableofcarrying passengers in sufficient number and safety to compete with tne Pullman car and the ocean greyhound. Until now, however, none of their plans has departed from the basic idea of the balloon—a silken bag inflated with illuminating gas, from which was suspended a car or basket. Nor has any one of the completed craft, not even the huge and obedient sky traveller built by Count Zeppelin, been large enough to carry a profitable number of passengers. Moreover, these balloons do not hold their buoyancy long enough for extended voyages. The gas deteriorates, and they must be refilled frequently. The Nixon balloon will discard the silken bag in favor of what is called a "buoyancy chamber" made of steel, which will contain pure hydrogen gas. This latter, properly confined, will last for years without deterioration or need of renewal. It follows that it will not be necessary to bring the vessel to the ground to renew her gas, as she will continue to float until the wear of her machinery renders her useless. The ship will be equipped with 11 propellers, five on each side and a larger one in front. The side propellers will revolve on a horizontal plane when it is desired to raise or lower the craft, acting as helicopters. When, however, the ship has reached the desired altitude, the helicopters, which work on swivel joints, are adjusted to the vertical plane and propel the vessel forward. Two or more, or all of these may be used at once. Eight of them, it is estimated, will drive the ship at an average speed of 30 miles an hour; with 11, a speed of 40 miles will be attained. It is not necessary to use all the propellers at once when going with the wind, and the big craft could probably "coast" under these circumstances, much as an automobile or railway locomotive does when descending a grade.

One feature of the device will be the two automatic rudders, one horizontal and one vertical, by means of which, and the governing mechanism, the ship will maintain her altitude and direction automatically. Acting in combination with the barometer, which makes and breaks an electric circuit controlling the motor which handles the altitude or horizontal rudder, the latter is forced to act so as to compel the aerial craft automatically to conform to the curvature of the earth. The vertical rudder, which governs the direction of the ship, also acts automatically through an electric motor, whose circuit is made or broken by a connection with the compass. For example, should the vessel be travelling west and the wind blowing from the north, she would automatically be pointed northwest, but she would travel straight to her destination.

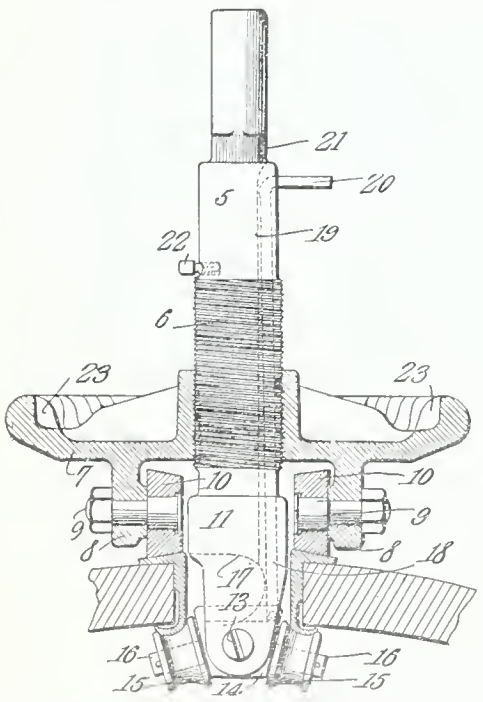
There are many, says Mr. Nixon, who regard the project as visionary, but the same criticism was made when the first steamship was launched, and the idea of crossing the ocean in it was hooted. When the first elevated railway was built in New York, people said it was a silly operation. When bids for the subway on Manhattan Island were solicited, only two contractors were willing to consider it. Many of the problems in connection with the distribution of material, sizes of scantling, calculations for strength and stability, are similar to those met in steamship design. Gas will be used to supply the engines, and within the great steel plated structure will be a number of silk receptacles to hold the hydrogen. There is no reason, he declares, why it should not work successfully.

CLEVER NEW PATENTS.

Expander and Flanger.—Chain Propeller. Fence Post Mold.—Blackboard Eraser Cleaning Machine.

Expander and Flanger.

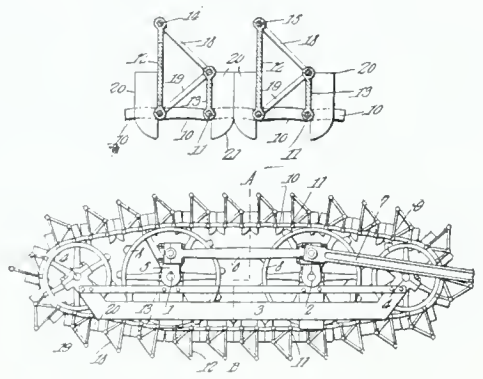
A flanging implement, adapted to engage the inner surface of a keg adjacent to the bunghole, and to hold the bushing securely therein, has been patented by Frank Pfluger and Emil Christensen, of Portland, Oreg. It is an improvement over a previous patent, and has particular application to the thrust rollers of the apparatus, which are arranged to be carried by the feed wheel, thereby strengthening the instrument and insuring a smoother job. As will be seen in the drawing, 5 represents the stock of the implement, which has a threaded portion 6 on which a feed wheel 7 is mounted by screw threads in its bore. The feed wheel is formed with the depending ears 8, having perforations for the axles 9 of the thrust rollers 10. At the lower end of the stock is a head or enlargement 11, provided with a slot in which is pivotally mounted on a pin 13, the axle 14 of the expanding rollers 15, said axle having at its ends spindles 16, on which said rollers are mounted. The head is recessed at 17 to receive one of the rollers, when the implement is being placed in an operative position within the bushing. The axle 14 is swung by means of a lever 18 lying in a longitudinal groove 19 in the stock, the free end of the lever forming a handle 20. The upper end of the stock is squared to fit into the socket of an operating member.



Adjacent to the upper end of the threaded portion 6, the stock has a set screw 22, to limit the upward travel of the feed wheel 7, the rim of the latter being provided with corrugations to give a better hold. The implement is inserted into the bushing by swinging, through the lever 18, the axle 14 on its pivot, so as to bring one of the rollers 15 into the recess 17. The implement is then inserted into the bushing and the axle swung back to bring the rollers into operative position. The feed wheel 7 is now turned until the thrust rollers 10 are in contact with the outer end of the bushing and the flanging rollers 15 with the inner end. The stock is rotated, the feed wheel being simultaneously operated to force the rollers closer together, whereby the inner end of the bushing is expanded and formed into an outwardly disposed flange which engages the inner surface of a keg adjacent to the bunghole and holds the bushing securely therein. If desired, the stock may be held stationary and the barrel rotated. By mounting the thrust rollers directly on the feed wheel, they will continually change position with respect to the flanging roller, which gives flexibility and also results in smooth work. The thrust rollers are frusto-conical, by reason of which they will lay down the flange closer to the keg.

Chain Propeller.

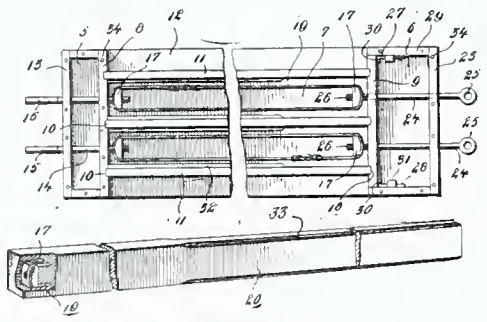
This invention is an improvement upon propellers of the paddle wheel type, and was made and patented by John S. Orr, of Augusta, Ky. The object is to produce a paddle wheel propeller in which the blades will remain in operative engagement with the water through a materially greater portion of their travel than is the case with ordinary paddle wheels of the circular type. The illustrations show



the propeller complete in the lower figure, while the upper figure gives on a larger scale, a pair of adjacent buckets or paddles. Referring first to the top figure, it will be seen that each paddle consists of a wide blade 12 and a narrow blade 13 extending entirely across the series of chains 10, parallel to each other, the two blades being braced by bars 18 & 19. The lower ends of the blades 12 and 13 are connected directly to the links of the chain, while their upper ends are connected by bolts or rods 14 and 15. In the lower figure the buckets are shown arranged in an endless chain series, the chains passing around a series of sprocket wheels 8, which are given rotation by the movement of the chains, said movement being communicated to a suitable source of power by pitmen 6 and 7. It has been demonstrated that the efficiency of the structure is high compared with the ordinary rotary paddle wheel. Only a small portion of the movement of the buckets within the water is lost on entering and leaving the water, and consequently nearly all the active movement of the buckets is utilized.

Fence Post Mold.

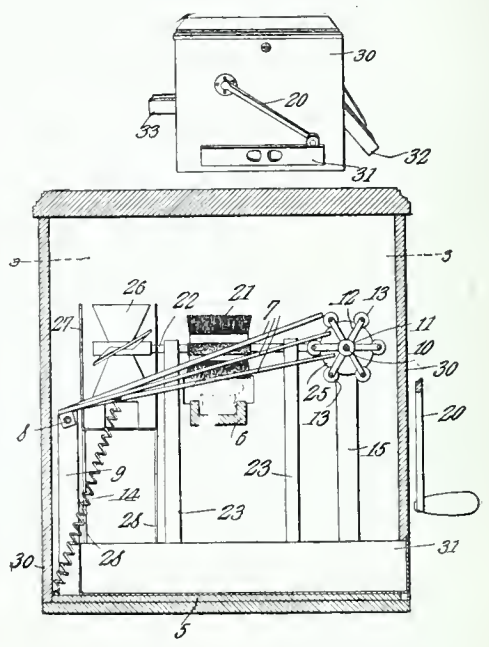
Wood is becoming so scarce that it is no longer used in certain sections of the country for posts, and the construction of cement fence posts is now an established industry. Along this line a recent invention of Philip J. Haas, of York, Nebr., is worthy of special consideration. His object is to provide a reinforced artificial stone fence post, though the device could be employed to make hitching posts, or railway ties. The lower figure of the illustration shows the article complete; and it will be noted that reinforcing wires 19, in the form of loops, are arranged longitudinally within the posts, the loops engaging nuts 17 at each end. The nuts therefore become embedded in the concrete, and they provide anchoring members for the reinforcing loops or wires.



The invention resides in the construction of the mold illustrated in the upper figure. It will be seen that tension rods 14 and 24 are mounted in the end walls of the mold, said rods being in pairs, and the rods 14 being provided with operating handles 15. The inner ends of said rods 14 and 24 are threaded for the reception of the nuts 17. Passing around the nuts are the longitudinal reinforcing wires 19, which are arranged in the form of loops. In the construction of mold shown in the drawings, provision is made for manufacturing two posts at the same time, as the side walls 11 provide two separate compartments for the construction of independent posts. In making the fence posts, the reinforcing wires or loops 19 are positioned on the nuts 17, and the tension of the wires adjusted by turning the handle 15, after which the cement, concrete or other plastic material is filled into the compartments 7 around the wires and nuts. After the cement has sufficiently set, the catches 27 are released, and the end wall 9 is moved laterally, thus permitting the side walls 11 to be swung on the base plate to permit the removal of the molded product. Of course before the removal of the post from the mold, the rods 14 and 24 are released or disengaged from the nuts, thus leaving said nuts embedded in the concrete. The holes left by the withdrawal of said rods are subsequently closed by filling the same with cement.

Blackboard Eraser Cleaning Machine.

How to clean blackboard erasers is a problem for the modern school. The erasers get so full of chalk that they smear instead of cleanse the boards, and the usual method of freeing them from chalk, by having some small boy beat them, is primitive indeed. The air is filled with the dust, making it bad for the children to breathe and the clothing of the pupils is soiled. A real novelty in the shape of a machine to accomplish this purpose has been devised by James A. Jones, of Logansport, Ind. The erasers are fed into the machine, the dust is removed therefrom, and they emerge clean and ready for further use. The illustrations show an exterior view and an interior sectional view, the latter being on an enlarged scale. From the small view at the top may be seen the crank handle 20, the end of the tray 31, in which the dust is collected, and the chute 32, down which the erasers, when clean, are discharged.



The erasers to be cleaned are fed through the machine on a slideway 6 which is shown in the bottom figure. Above the slideway are a plurality of beaters 7 which are made resilient by springs 14, to impart a sharp and forcible blow against the eraser. This is done through the operation of the rotatable shaft 10, which carries arms 12 contacting with the free ends of the beaters 7. Above the slideway 6 and behind the beaters is mounted a rotary brush 21, which extends transversely across the slideway and engages the eraser as it leaves the beaters. A fan 26 draws the dust from the erasers into the fan casing, from which it is discharged through a suitable nozzle provided with a hose, whereby the dust may be conducted to a window or a furnace. In practice the felt side of the eraser is presented to the beaters, and while one eraser is under the brush, 21, another is being acted upon by the beaters. The passage of the erasers along the slideway feeds them through the machine one by one.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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DAVIS & ROESCH TEMPERATURE CONTROLLING CO. v. NATIONAL STEAM SPECIALTY CO.

(Circuit Court, N. D. Illinois, E. D. Aug. 4, 1908. 164 F. R. p. 191.)

1. JUDGMENT—PATENTS-SUIT FOR INFRINGEMENT—DEFENSE OF ANTICIPATION—RES JUDICATA.

In a suit for infringement of a patent, the question of priority of invention is not res judicata because of a decision in favor of the patent in interference proceedings in the Patent Office between the same parties; the question whether the patent is void for anticipation being one in which the public has an interest, as well as the parties.

2. PATENTS—ANTICIPATION—ABANDONMENT BY PRIOR INVENTOR.

The making of an invention and its reduction to practice, without any public use or other act placing the public in possession of the invention, although the inventor may by delay in applying therefor lose his right to a patent, does not constitute an abandonment of the invention to the public, which will invalidate a patent subsequently granted to another therefor.

3. SAME—THERMOSTAT.

The Roesch patent, No. 759,472, for a thermostat, held valid as against the defense of anticipation.

TURNER BRASS WORKS et al. v. APPLIANCE MFG. CO.

(Circuit Court, N. D. Illinois, E. D. Aug. 4, 1908. 164 F. R. p. 195.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION—PRIOR ADJUDICATION.

Ordinarily a decision of the Patent Office in interference proceedings, awarding a patent to one of two applicants, does not constitute a prior adjudication of the validity of the patent, which will warrant the granting of a preliminary injunction to restrain its infringement even against the unsuccessful applicant, nor estop him from contesting its validity, except on the ground of his own priority of invention.

ROYALES SALES CO. v. GAYNOR et al.

Circuit Court, S. D. New York. Sept. 22, 1908. 164 F. R. p. 207.)

1. COPYRIGHTS—SUBJECT OF COPYRIGHT—MONOGRAM.

Defendant copyrighted a book describing a monogram used on a campaign badge, which was sold pinned to the book, and assigned the copyright, which was subsequently acquired by complainant. Held, that the copyright did not cover the monogram, which was not a subject of copyright.

2. COURTS — FEDERAL COURTS — JURISDICTION.

Where plaintiff sues to enjoin the infringement of an alleged copyright by the person who assigned the same to him, but the matter was not subject to copyright, he cannot claim that defendant, as assignor, was estopped from alleging that the federal court had no jurisdiction because the copyright which he sold did not cover the matter in question, and where there is no requisite diversity of citizenship his bill will be dismissed.

3. SAME.

Where the jurisdiction of a federal court in a suit depends entirely upon the alleged infringement of a copyright, and the thing so alleged to be infringed is not within the copyright laws no estoppel on the part of defendant to deny such fact can confer jurisdiction.

BARNES et al. v. PIERCE.

(Circuit Court, S. D. New York. Sept. 23, 1908. 164 F. R. p. 212.)

TRADE-MARKS AND TRADE-NAMES — UNFAIR COMPETITION—INJUNCTION.

The manufacturer of an antiseptic, to which he gave the artificial name "Argyrol," held entitled to an injunction to restrain defendant, a jobbing druggist, from placing argyrol on his price list and supplying customers who called for the same with a different and cheaper preparation in its place.

BOSTON WOVEN HOSE & RUBBER CO. v. PENNSYLVANIA RUBBER CO.

(Circuit Court of Appeals, First Circuit. July 15, 1908 164 F. R. p. 556.)

PATENTS (§ 157*)—CONSTRUCTION OF CLAIMS—PAPER PATENTS.

The rule applied that in a suit for infringement of a patent for an alleged invention of which no practical use has ever been made, the patent is not entitled to the same breadth of construction which might be warranted by its proved usefulness.

PARSONS NON-SKID CO., Limited, et al. VICTOR TIRE GRIP CO.

(Circuit Court, D. New Hampshire. Oct. 22, 1908. 164 F. R. p. 617.)

1. PATENTS (§ 298*)—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

Unless a patent is supported by public acquiescence, or prior adjudication, or some other peculiar condition, the complainant's rights must be free from doubt to entitle him to a preliminary injunction.

2. PATENTS (§ 328*)-ARMOR FOR PNEUMATIC TIRES.

The Parsons patent, No. 723,929, for an armor for pnenmatic tires, the validity of which had not been adjudicated, held not so clearly valid or supported by general acquiescence as to warrant the granting of a preliminary injunction against an alleged infringer.

MORTON v. LLEWELLYN et al.

(Circuit Court of Appeals, Ninth Circuit. Oct. 19, 1908. 164 F. R. p. 693.)

1. PATENTS (§ 310*)—SUIT FOR INFRINGEMENT—DEFENSES—PLEADING.

The defendant in a suit for infringement of a patent must give notice in his answer of any defense by way of prior patents, publications, or public use relied on to show want of novelty or invention, otherwise such evidence is receivable only to show the state of the art, and to aid in the proper construction of the patent in suit.

2. PATENTS (§ 35*)-EVIDENCE OF INVENTION—SUCCESS OF DEVICE.

Apart from the presumption of novelty arising from the grant of a patent, where it is shown that the patented device has gone into general use and has superseded prior devices having the same purpose, it is sufficient evidence of invention in a doubtful case.

3. PATENTS (§ 328*)—INFRINGEMENT-DRAINAGE PIPE FITTINGS

The Walker patents, No. 635,659 and No. 788,803, for soil pipe drainage and venting fittings, held valid as disclosing novelty and invention, but not infringed.

STERN et al. v. JEROME H. REMICK & COMPANY.

(Circuit Court, S. D. New York. Oct. 27, 1908. 164 F. R. p. 781.)

COPYRIGHTS (§ 70*)—ACTION TO RECOVER PENALTIES FOR INFRINGEMENT—PROCEDURE.

A circuit court has authority under Rev. St. § 716 (U. S. Comp. St. 1901, p. 580), to issue a writ for the seizure of infringing copies of a copyright publication alleged to be in the possession of the infringer as preliminary to an action under Rev. St. § 4965 (U. S. Comp. St. 1901, p. 3414), to recover the penalty prescribed therein for each copy found in the possession of the defendant, such writ being one necessary for the exercise of the court's jurisdiction, since under the ruling of the Supreme Court such copies must be "found" before the cause of action to recover the penalty accrues.

DR. MILES MEDICAL CO. v. JOHN D. PARK & SONS CO.

(Circuit Court of Appeals, Sixth Circuit. Sept. 10, 1908. 164 F. R. p. 803.)

MONOPOLIES § 17*-CONTRACTS IN RESTRAINT OF TRADE — SALE OF PROPRIETARY MEDICINE.

A system of contracts between the manufacturer of a proprietary medicine made in accordance with a secret formula but unpatented and all dealers authorized by it to handle such medicine, whether regarded as contracts of sale or agency, by which jobbers are prohibited from selling to any except retailers licensed by such manufactures, and retailers are prohibited from selling to any save those licensed to buy or to persons buying for consumption only, and neither jobber nor retailer is permitted to sell except at prices imposed by the manufacturer, the purpose and effect being to maintain prices by preventing competition in price between either jobbers or retailers, where it affects interstate sales, is illegal both at common law and under the federal anti-trust act of July 2, 1890, c 647, 26 Stat. 209 (U. S. Comd. St. 1901, p. 3200), as in restraint of trade.

EXPANDED METAL CO. v. GENERAL FIREPROOFING CO.

(Circuit Court of Appeals, Sixth Circuit. Oct. 16, 1908. 164 F. R. p. 848.)

PATENTS—PROCESS-DESCRIPTION OF MEANS PROCESS OF EXPANDING SHEET METAL.

The Golding patent No. 547,242, for a method of making expanded sheet metal by slitting and stretching the sheet at the same time, is not invalid for insufficiency of description of the means by which the process may be practiced, nor because for the function only of a machine, but covers a new, useful, and patentable improvement in the art of expanding sheet metal, and is valid. Also held infringed.

MARSHALL v. PETTINGELL-ANDREWS COMPANY.

(Circuit Court of Appeals, First Circuit. Sept. 25, 1908. 164 F. R. p. 862.)

1. PATENTS—CONSTRUCTION OF CLAIMS.

Where one claim of a patent specifically names two elements, and another claim specifically names these two elements and in addition thereto a third element, it must be presumed that the patentee intended to limit the claims to the elements enumerated.

2. PATENTS—INVENTION—SUBSTITUTION OF MATERIALS—INSULATING LININGS.

The Marshall patent No. 784,695, for an insulating lining for the metallic shell of an incandescent lamp socket consisting of a paper tube held in the metallic shell by its resiliency and yet easily removable, claims 5 and 9, which are broad claims, which do not include as an element a change in form from the linings of the prior art, are void as merely involving the substitution of paper as the insulating material for the fiber tubing previously used, the only advantage being its greater compressibility and resiliency, which were well-known qualities, and also because such broad claims are devoid of patentable novelty in view of the earlier Hart "Diamond H" switch cap, which had a paper lining similar in use, purpose, and function.

GOODYEAR TIRE & RUBBER CO. v. RUBBER TIRE WHEEL CO. et al.

(Circuit Court S. D. Ohio, W. D. July 18, 1908. 164 F. R. p. 869.)

PATENTS—SUIT FOR INFRINGEMENT-EFFECT OF DECREE FOR DEFENDANT.

A final decree in favor of the defendant in a patent infringement suit entitles him to continue to make and sell the alleged infringing article free from interference by the complainant by virtue of the patent, and a court of equity having jurisdiction of the parties may by a decree in personam enjoin the complainant from interfering with the defendant's business by bringing suits against his customers, based on the same patent, either in this or a foreign country.

LIBERTY v. CHAMPION-INTERNATIONAL CO.

(Circuit Court, D. Massachusetts. Nov. 2, 1908. 164 F. R. p. 877.)

PATENTS— INFRINGEMENT — PAPER-DRYING MACHINE.

The Liberty patent No. 629,696, for a lath-carrying device for paper-drying machines, claim 2, which specifies as an element of the combination "hoppers for feeding the said laths," must be read in the natural sense of its terms, and is limited to a machine employing a plurality of hoppers, and is not infringed by a machine having a single hopper.

WESTRUMITE CO. OF AMERICA v. COMMISSIONERS OF LINCOLN PARK.

(Circuit Court, N. D. Illinois, E. D. Oct. 6, 1908. 164 F. R. p. 989.)

PATENTS—INVENTION—METHOD OF SPRINKLING STREETS.

The Van Westrum patent No. 752,487, for a method of sprinkling streets, consisting of treating the loose surface of roads or streets with a mixture or "solution" of oil and water, is void on its face, there being no patentable invention or novelty in using a mixture of oil and water for that purpose, and no method known or disclosed by the patent of combining the two in solution.

H. MUELLER MFG CO. v. A. Y. McDONALD & MORRISON MFG. CO.

(Circuit Court, N. D. Iowa. E. D. Oct. 14, 1908. 164 F. R. p. 991.)

1. PATENTS—INVENTION—CHANGE OF FORM.

The making in one piece of that which was formerly made in two, or in two pieces what was made in one, when the function of the device is not changed is not invention, but the work of the mechanic only.

2. PATENTS — ANTICIPATION — STOP AND WASTE COCK

The Mueller patent No. 513,272, for a stop and waste cock, is for specific improvements only in stop and waste cocks previously in common use, and must be strictly limited and its claims interpreted in the light of its specifications, and, as so construed and limited, it is void for anticipation by numerous prior patents and structures, which disclose each one of its elements or its equivalent and produce the same result.

BRUNSWICK-BALKE-COLLENDER CO. v. ROSATTO.

(Circuit Court of Appeals, Third Circuit, Nov. 12, 1908. 165 F. R. p. 56.)

PATENTS—INVENTION—BOWLING ALLEY.

The Wiggins patent, No. 623,933, for a bowling alley, in which a concave side gutter is substituted for the square form in previous use, is void for lack of patentable invention.

CLIFFORD v. CAPELL.

(Circuit Court of Appeals, Third Circuit, Nov. 10, 1908. 165 F. R. p. 163.)

PATENTS—LICENSES-LIABILITY FOR ROYALTIES.

In an action by a patentee on a license contract to recover royalties, the plaintiff is entitled to recover royalties on articles made and sold by defendant, shown to be substantially those of the patent, although not purporting to have been made thereunder, and claimed by defendant not to be covered thereby.

CARNEGIE STEEL CO. v. COLORADO FUEL & IRON CO.

(Circuit Court of Appeals, Eighth Circuit, Nov. 11, 1898. 165 F. R. p. 195.)

PATENTS—SUIT FOR INFRINGEMENT—EQUITY JURISDICTION.

A bill for an injunction and damages for infringement of a patent having at the time of filing the bill a little less than three months to run, which prays for preliminary injunction and contains allegations entitling complainant to the same, confers jurisdiction on a court of equity to award an accounting for damages and profits, although no motion for a preliminary injunction was in fact made, and the patent expired before the time the defendant was required to plead.

DONNER v. AMERICAN SHEET & TIN PLATE COMPANY.

(Circuit Court of Appeals, Third Circuit, November 20, 1908. 165 F. R. p. 199.)

PATENTS—INVENTION—METHOD OF ROLLING BLACK-PLATE.

The Donner patent No. 620,541, for a method and mechanism for rolling black-plate by means of sets of rolls arranged in a continuous train, discloses nothing new of utility in the art, it having been proved in practice that in continuous rolling, the plates in the stack stick together and produce scrap to such a degree as to make such rolling commercially unsuccessful, and no means of preventing such result being shown in the patent. Claim 4 is also void for lack of novelty.

AMERICAN TOBACCO CO. v. ASCOT TOBACCO WORKS. SAME v. KHEDIVIAL COMPANY.

(Circuit Court, S. D. New York. Dec. 3, 1908. 165 F. R. p. 207.)

PATENTS—ASSIGNMENT—FORM AND SUFFICIENCY.

No particular form of assignment of letters patent is prescribed by statute, and any written conveyance duly signed and sufficiently specific to identify the property is sufficient.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Samuel F. Phillips, Ashboro, N. C. Wheel for Wheelbarrows.—An object of the present invention is to provide a single plate metallic wheel, equipped with an annular series of inwardly tapered sector-shaped sections, arranged in staggered relation and extending from the hub to the rim, and having their outer portions united with the latter in a plane co-incident with the median line of the rim, whereby maximum strength and lightness are secured.

Robert V. Hoffman, Brenham, Tex., inventor; W. F. Hermann, Brenham, Tex., assignee. Hydrocarbon Burner. The primary object of this invention is to provide a hydrocarbon burner, designed particularly for domestic purposes, such as cooking and heating, and capable of being readily installed and of being easily controlled. Another object of the invention is to produce a burner in which steam is employed, and to provide a steam generator that is automatic in its character, is heated by the burner and yet protected from injurious action by the flames thereof, and will not require constant attention and regulation in order that the steam supply to the burner may be properly proportioned to the fuel delivered.

William Linhoff, Pasadena, Cal., inventor; Dorothy M. Stout, Bloomfield, N. J., assignee. Fender for Lawn Sprinklers.—An object of this invention is to provide a device designed to be readily applied to various forms of lawn sprinklers and sprayers, and adapted to cut off the spray at one side of a sprinkler or sprayer to a greater or less degree, adjacent to side walks and analogous places to prevent the water discharging over, wetting and wasting on such surfaces. Another object of the invention is to provide a fender for lawn sprinklers, adapted to be advantageously employed for spraying narrow strips of parking, gardens and the like, and capable of confining the spray within the desired limits.

Albert Whisler, Burlington, Kan., inventor; Major A. Speakman, Burlington, Kan., assignee. Screw Driver.—This invention has for its object to provide a screw driver, equipped with screw engaging jaws movable inwardly and outwardly to vary the distance between them to adapt the device for clamping screws of different sizes, and for holding the same in engagement with the blade of the screw driver. Another object of the invention is to enable the screw driver blade to be adjusted simultaneously with the screw engaging jaws, and adapted also to project beyond the same to enable the tool to be used as an ordinary screw driver.

John David Baker, Lisbon, O., inventor; Alpheus Arter, and George B. Harvey, same place, assignees of two-thirds interest. Two patents. Friction Gearing.—The first invention relates to friction driving means for automobiles or self-propelled vehicles, but its use is not limited to this type of mechanism. The principal objects of this invention are to provide a means of a very simple nature for effecting the friction engagement between the co-acting friction members so as to secure a yielding contact, the face of which can be increased as desired, and to provide a driving disk which is carried by the engine or driving shaft, but which does not require any endwise movement of the shaft when the shaft is adjusted.

John David Baker, Lisbon, O., inventor; Alpheus Arter, same place, assignee of one-half interest. Hay Loader.—The second invention relates to hay loaders, and has for its objects to provide a novel and simple structure, which can be readily attached to the rear of a vehicle, and will effectively pick up all the hay or other material in its path of movement and elevate it into said vehicle; and to provide means which will not become clogged or choked in operation, and will deliver the material to a comparatively high point in order that a maximum load may be placed on the wagon.

John S. Butterworth, Wallingford, Pa., inventor; Benjamin C. Fox, Chester, Pa., assignee of one-half interest. Process of Manufacturing Yarn.—The primary object of this invention is to provide a novel and simple process wherein from carded stock of practically any grade, yarn can be effectively produced with substantially any fineness of count desired, said yarn having the appearance of worsted, and the process being without the expense or waste incident to the production of the latter. The process consists in forming a stock of mixed cotton and wool, spinning the yarn from said stock, and then subjecting the yarn to an acid carbonizing treatment to thereby destroy the cotton fiber and leave the yarn composed of wool.

Charles E. Cox, Merrill, Oregon. Section Press and Foundation Setting Mechanism.—This invention relates to means for preparing honey holding section boxes for use in bee hive supers, and the principal object is to provide a simple and effective means whereby the joints of the section boxes can be pressed together and the foundation applied to the said boxes.

James A. Gardenhire, Nashville, Tenn., inventor; George F. Carter, same place, assignee of one-half interest. Copy Holder.—This invention relates to means for holding matter to be copied or transcribed on typewriting machines or the like, and has for its principal object to provide a holder that can be employed in connection with different kinds of typewriters, can be placed on a table or the like, will properly hold sheets either singly or in bulk, and is very convenient to operate.

Carl J. Lundquist, New Brunswick, N. J., inventor; Alfonz L. Linderblad, same place, assignee of one-half interest. Bottle or Jar Closure.—This invention relates to means for closing and sealing the mouths of jars, bottles and similar containers, and has for its object to provide a closure which can be readily applied and detached, can be used over and over again, and when in place, constitutes a complete and effective closure and seal that is not liable to become accidentally loosened or detached.

Frank S. Merrow, Mexico City, Mexico. Fish Tail Propeller.—The object of this invention is to provide a novel, simple and effective propeller having an oscillatory movement after the manner of a fish's tail, which the invention is designed to imitate.

William B. Runnion and Edward Runnion, inventors; Lewis S. Goff, Spencer, W. Va., assignee of one-half interest. Valve Operating Mechanism.—This invention relates particularly to means for controlling the passage of gas through supply conduits or pipes, and has for its principal object to provide a novel, simple, and practical means for automatically cutting off the supply of gas when the flame from a jet causes a fire, or in other contingencies.

Charles M. Loflin, Ellis, Kansas. Draft Equalizer.—The principal object of this invention is to provide a novel, simple and highly effective means for equalizing the draft when a greater number of the draft animals are located on one side of the central line of draft of an implement than on the other, or when one set of animals is located nearer the central line of draft than the opposite set.

Harry C. Morse, Penn Yan, N. Y. Spray and Water Guards for Boats. Three patents.—The first invention relates to means for preventing water and spray from dashing into boats, and has for its object to provide a device in the form of an attachment that can be quickly applied to a boat when the necessity arises, and can be easily detached therefrom, and when not in use can be compactly folded so that it will occupy but comparatively small space.

The second patent is an improvement on the first and relates to means for arresting the waves against the boat, and has for its object to provide a structure of this character that may be more readily swung between its operative and inoperative positions, and which will yield to the impact of any heavy bodies of water, thereby avoiding injuries to the structure as well as shocks and jars to the boat.

The third invention relates to canopies for small boats and the like, and has for its object to provide a simple and inexpensive structure which can be readily applied to, or removed from, a power launch or other boat, can be compactly folded when not in use, and has a wide range of adjustment so that persons can enter or leave the boat without interference and the occupants be shielded from the rain or shaded from the sun.

Hezekiah S. Bowler, Gloversville, N. Y., inventor; Harry A. Steele and Wm. F. Steele, assignees, same place. Brick Molding Machine.—This invention relates to means for forming bricks, and has for its object to provide a novel and simple structure whereby a comparatively large number of bricks may be molded at each operation of the machine, said machine being rapid in its operation and eliminating the necessity of the slow tamping process now ordinarily employed in mechanisms of this character.

Milton Forder, Thief River Falls, Minn. Coupling.—This invention relates to improvements in devices for coupling cables, rods, and the like, and the principal object is to provide a very simple but highly efficient structure which will lock with the parts to be coupled, so that their fixed relation, when clamped, is assured.

John P. Guidinger, Schuyler, Nebr. Bolting Cloth Cleaner.—The principal object of this invention is to provide a novel and extremely simple article of manufacture that can be cheaply produced and will effectively maintain bolting cloth in clean condition without injuring or materially wearing the same. It comprises a body of woven fabric having marginal portions that are unraveled and constitute a brush which operates against the bolting cloth.

Max Snyder, Beatty, Pa., and Anton Zuzak, Baggaley, Pa. Safety Catch.—The object of this invention is to provide a novel safety catch for inclined railroads such as are used in mines, which is simple and effective and will permit the proper upward and downward movement of the cars if the cable breaks while they are being drawn upwardly.

William I. Harp, Galax, Va. Indexed Book.—This invention relates particularly to an index for books, and has for its object to provide a marginal index of novel nature which will permit a book to be specifically indexed without regard to the number of pages therein; and also provides convenient and simple means whereby any page can be exactly found with ease and expedition.

Zion E. Fiveash and C. B. Leonard, McLaurin, Miss. Wood Distilling Apparatus.—This invention relates to means for extracting the various well known products, such as creosote, turpentine, and the like, from wood in the form of saw dust, chips or similar small pieces.

Nathan B. Stubblefield, Murray, Ky., inventor; Wireless Telephone System—Assignor to Conn Linn, R. Downs, George C. McLaren, John P. McElrath, B. F. Shroeder, Jeffer Roulett, Samuel E Bynum, Jr., and Charles H. Bradley, Murray, Ky.—This invention relates to means for electrically transmitting signals from one point to another without the use of connecting wires, and more particularly comprehends means for securing telephonic communication between moving vehicles and way stations, and has for its principal object to provide simple and practical means whereby clear and audible communication can be established.

George Moss, St. Peter, Minn. Cloth.—This invention relates to cloth for employment in chest protectors, under clothing and like articles to be worn next to the skin, and has for its object to produce such an article wherein the wool or other animal fibre constitutes the facing thereof while the backing is made of open mesh woven fabric, the fibre having the natural wool grease or animal fat still incorporated therein, and being placed in direct contact with the skin of the wearer.

Waldo E. Callane, Lebanon, Ind. Cross Arm Support. Two patents.—The object of the first invention is to provide a means for securing wire or like supporting cross arms to poles, the said means permitting the cross arm to be securely fastened in place without the necessity of cutting the pole, and the said device being readily adjustable to poles of different diameters.

The second patent relates to means for securing wires to insulators, and the primary object is to provide a novel structure which can be cheaply manufactured and be easily applied to an insulator and to a wire, will automatically take up slack and allow for contraction of the wire, and will permit the taking up of the wire without the necessity of its being disengaged from the insulator.

Frank E. Summers, Plainview, Tex. Telephone System.—The principal object of this invention is to provide a system for party lines that will permit two parties to communicate, and prohibit any one else on the line or lines from overhearing the conversation, the system being such that the systems now in use may be readily modified to include the same. A further and an important object is to provide means whereby parties along the line may communicate with those using the same, in order that the parties in communication may be notified of, and give way to emergency calls. The system permits of exclusive communication between two parties, and includes means which will permit other parties along the line to communicate with each other without interfering with, or being interfered with by those who are using the system for such purposes. A still further object is to provide means which will effect the operation of any predetermined call at the exchange from any instrument along the line, regardless of whether other instruments are in use or not, such operation acting as a check on unwarranted or malicious interference with the parties talking.

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FOR SALE—Patent No. 933,951, dated Sept. 14, 1909. Mailbag Receiving and Delivering Device. Simple and practicable. Nothing like it on the market. Send for terms. Address, Herman H. Behnke, No. 212 West Fifth Street, Davenport, Iowa. mar

FOR SALE—Patent No. 910,950. Concrete Ornamental Lawn Fence. Very attractive. Will sell right or half interest. Pays to market. Full particulars with pleasure. Address, Box 9, St. Jacob, Ill. mar

FOR SALE— Patent No. 913,988. Self Feeder Potato Planting Sack. Price $200. Drops the potatoes directly into the planter from the sack. If interested write me for copy of patent. A. C. Simonis, R. F. D. No. 1, Box 78, Amherst Junction, Wisc. mar

FOR SALE on royalty, my wrench—U. S. Patent No. 632,951, Aug. 31, 1909. No screws, springs, or teeth to play out. Strongest, cheapest, and handiest wrench on the market. Address, A. R. Bell, Evesham Via Macklin, Sask., Canada. mar

FOR SALE—A valuable patent tool. Spacing instrument, a divider and caliper for the measurement of solid or tubular columns inside and outside. Cheaply manufactured; large profits. An aid to mechanics, designers and other professions. Further particulars will be furnished by Theodore Siragusa, No. 463 Broadway. Paterson, N. J. mar

FOR SALE—Patent No. 932,931, issued August 31, 1909. Gold Saving Apparatus. A new practical automatic, mechanical combination for extracting gold from gravel. Ninety per cent of the gold contained in the matrix is recovered, whether in a fine, scaly, rusty or other state. Address, V. P. Yelmini, 2905 Lincoln Ave., Alameda, California. mar

FOR SALE—Patent No. 870,949. Trunk-Tray Form. A time and labor-saving device, which means something to the employer. Investigate! Drawings mailed free. Price $2,000. Address, W. S. Gilson, 347 South State Street. Chicago, Ill. mar

FOR SALE—Patent No. 937,299, issued October 19, 1909. Derrick bracing means. The real anchor discovered at last. To prevent the wind storms from destroying oil derricks and wind mills. Address, Frank E. Foster, Sapulpa, Oklahoma. mar

FOR SALE—Patent No. 927,208. dated July 6, 1909. Will sell broom hanger with two improvements, United States, $800; also invention in Canada for $800. Will take one cent on royalty, sell outright, or strictly honest partner. I have other inventions. Address, James H. Ashmead, Lake George, N. Y, mar

FOR SALE—Improved Syphon Cream Separator and Milk Skimmer for household milk bottles. Address, William Kolvig, No. 54 Beacon Street, Quincy, Mass. feb

FOR SALE—I am owner of Collapsible Box, patented August 31, 1909, No. 932,806. Will sell same for $3,000. Address, Oscar A. Paulson, River Falls, Wisconsin. feb

FOR SALE—Patent No. 915,003, issued March 9, 1909. The Whisler automatic screwdriver: the best on earth. Address, Box 364, Burlington, Kansas. feb

FOR SALE—U. S. Patent No. 889,151, granted May 26, 1608. Street Car Fender. Has telescoping section to save persons struck by moving car. Address, H. M. Prater, Box 27, Crocker, Missouri. feb

FOR SALE—Patent No. 856,018. Power Shovel. Price $1000. Patent No. 917,525, Safety Appliance for R. R. Cars, $4000. For further information write to R. Belden, Pulga, Cal. feb

FOR SALE—Patent No. 924,392, issued June 8, 1909. This invention is a weeding attachment for any cultivator. Will sell outright or fifteen per cent on royalty. Good for potatoes, hops, corn, etc. Address, J. J. Smith, Banks, Oregon. feb

FOR SALE—U. S. Patent, No. 630,598, issued August 10, 1909. Sash Fastener. Something simple, cheap to manufacture, useful and convenient. Should be welcomed as an assurance of safety in every home. Address, Robert Henry, Blue Lake, Humboldt County, Cal. feb

FOR SALE—Patent No. 923,820. Metallic Cross Tie. Patented June 8, 1909. For information address, G. A. & A. M. Dickey & C. H. Hoag, Judsonia, Arkansas. feb

FOR SALE outright or on royalty—Patent for Safety Stop for Cars. For further information apply or write to William Gunter, Federal Hill, Frostburg, Maryland. feb

FOR SALE—U S. Patent No. 927,356. Also Canada and Great Britain patent rights. Wonderful heating drum, throws all the heat down, absolutely no odors; burns half the gas of any stove of its size known. Will sell one or all three patents. For description, illustration, etc. Address, Dr. W. S. Keyser, Everett, Wash. feb

FOR SALE—Patent No. 917,951. Bit. Calf, colt, cow weaner. Will sell right. The present invention inserted in the mouth of the animal suffering with bloat will save it from dying. Address, J. C. Krause, Bessie, Okla. feb

FOR SALE—Patent No. 929,478, issued July 27, 1909. Alarm for Boilers. For terms address, Ernest Parish, R. F. D, No 2, Milford, N. Y. jan

FOR SALE—Wonder Rupture Truss and Bandage. Can be worn day and night. Can sleep in it. No torture, sure fit. Patent just out. Order from J. F. Cruff, Box 235, Providence, R. I. jan

FOR SALE—Patent No. 893,309, issued July 14, 1908. A torch to ignite blast fuses. When lit with a match cannot be blown out. Will dispose of outright on liberal terms. Address, John Craighton, Deer Lodge, Montana. jan

FOR SALE—Patent No. 893,213, issued July 14, 1908. Respirator. A great benefit to consumptives, mine, mill and metal workers. Can be cheaply manufactured. Will sell cheaply or on royalty, Address, W. T. Whiteway, Grand Falls, Newfoundland. jan

FOR SALE— Patent No. 934,259. Oil can. Will come into universal use. Very cheap to make and effective in use. Will oil every time and no excess of oil to soil machinery or fabric. Address, H. J. Allen, 2310 E. Beach St., Biloxi, Miss. jan

FOR SALE—Patent No. 918,730, dated April 20, 1909. Door Opener. A device for opening doors with the foot. Can be attached to any door having a common lock. A useful article and should have an extensive sale. Want correspondence with honest men or manufacturers to place door opener on the market. Will sell outright or part interest at reasonable price. Address, K. I. Bronson, R. R. No. 1, Rice Lake, Wisc. feb

FOR SALE—Patent No. 925,638. Every manufacturer ought to know what the old original shoe-calk did for its manufacturer. I have the new improved shoe calk. Manufacturers do you know what that means for you! Address, P. O. Box 405. Davis, W. Va. jan

FOR SALE—Patent No. 926,856. Combined Belt Slide Button and Drawers Supporter, dated July 6, 1909. Will sell outright or place on royalty plan with reliable firm. Address, Arthur C. Davis, Mulberry, Florida. feb

FOR SALE—Patent No. 930,903. Irrigation ditch outlet or floating water gauge. Avoids difficulties due to irregularity of flow. A great labor saver. Good for either a company or private users of water, as it allows a fair distribution. Address, William H. Tucker, Vernon, B. C., Canada. feb

FOR SALE—Patent No. 932,269. Smoking pipe for automobilists. Tobacco or ashes do not blow out while riding in a fast motor. No wind, rain or air pressure can get into pipe. Will be a big money-maker. Address, Albert Gloede, Suffern, N. Y. feb

FOR SALE—Patent No. 899,489, dated Sept. 22, 1908. Pick Ax Guard. A device that is much needed in rock work and coal mines. Saves the handle from wearing out and keeps it solid in eye of pick. A simple working device. Cannot be a better one invented. Would like to hear from any one who buys patents. Address, T. W. Gordon, East Franklin, Maine. feb '10

FOR SALE—Patent No. 620,239, issued May 4, 1909. Mail Receiver and Deliverer. Will sell outright at a reasonable price. For particulars, address Joseph O. Anderson, Bercail, Mont. mar '10

FOR SALE—Patent No. 924,514, dated June 8, 1909. This is a great money saving device for railroads. No more batted joints. Will greatly increase the life of rails. Will sell outright or on royalty basis. Address, John Warchock, Box 43, Seney, Mich. feb '10

WANTED.

WANTED—A company to buy or manufacture on royalty patent No. 782,600. A holder to make teneriffe lace work on. Does away with loose pins and outside catches. Address, Mrs. R. E. Dexter, Fayville, Illinois. feb

WANTED—To place on a royalty patent No. 928,101, issued July 13, 1909. Improvements in handles for cooking utensils. R. R. Brakeman, 316 Kirkland St., Palatka, Fla. jan

WANTED—Owner of Patent No. 896,133, is arranging Mfg. Co., and wants others having small patented articles or ideas to join him, with a view of placing our own inventions on the market. Address, Mayer Mfg. Enterprise, Minneapolis, Minn. jan

WANTED—A company to buy or manufacture on royalty patent No. 884,672, apparatus for sharpening lawn mowers. A good seller wherever grass grows and lawn mowers are used. Address, H. E. W. Loomis, Dumont, Iowa. dec

WANTED—A manufacturer to make and put on the market on royalty the best patented combination padlock ever invented. Address, James N. Mills, 401 Flowers Ave., Pittsburg, Pa.

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A New Patent Office Building.

Every Commissioner of Patents for the last twenty years, has urged the necessity for a new building for the Patent Office in his reports to Congress. Those who have watched the efforts to change and improve the present structure so as to make it capable of accomodating the force now required for the work, will bear witness to the ingenuity displayed by the authorities. As far back as 1880, it became obvious that sometbing would have to be done to stop the influx of models, wbich took up so much space and were rapidly increasing in number. In that year a law was accordingly passed, making it unnecessary for applicants for patents to present a model, unless one was called for by the Office. Owing to improvements in photo litbography and the cheapening of methods of reproducing drawings, and the modifications of the rules of the Office witb respect to the preparation of the latter, tbe practice of demanding models has been entirely discontinued. If this change in the statute had not been made, the building would have been literally swamped with models.

For many years the third story of tbe structure was equipped with handsome cases, in which were displayed the models formerly received. It was an exhibit of both bistoric and current interest, and numbers of visitors could be daily seen examining the small machines, tracing the development of the car coupler or the sewing machine, or studying curious devices which have never been put into general use. The growth of the Patent Office, however, demanded not only that the models should cease coming, but that those already on hand sbould be removed to make space for the employes engaged in the work; and so the models had to go, and with them went one of the sights of Washington. The bureau gained a number of rooms; but the expedient after all proved to be but temporary. The officials tben had all the records moved from the upper floors to the basement. In order to make tbe latter available, a sunken area was constructed along one side of the building, thus affording better light. This released certain other rooms for the use of the clerical force, but they were promptly filled, and tbe congestion has again become almost intolerable.

In his last report, as noted in the INVENTIVE AGE for December, the Commissioner recommends tbe remodeling of the basement on the other three sides to correspond to the one above described, and says if this plan were carried out, it would result in relief for the next two or three years. He suggests, however, that the rapid growtb of the Office, which keeps pace with that of the country, will soon develop beyond any possible remedy which can be given by changes in the present structure. It cannot be increased in height without destroying its architectural beauty. The various schemes already tried have been at the expense of other portions of the building.

The Patent Office has, since its creation, been more than self-supporting. Each year there has been a large surplus turned back into the Treasury, after deducting every item of expense charges in the Office. The net surplus up to this time is $7,060,547. It is due to the inventors of tbe country tbat this money should be utilized for the purpose of providing suitable facilities for expediting the work. Great Britain and Germany have lately responded to the demand for more spacious accomodations for their patent bureaus, and have erected buildings which are much better adapted to the purpose than the one wbich now houses the United States Office, although the business of both of those countries combined would not compare with that transacted here.

The building now occupied by the Patent Office was originally intended for the entire Department of the Interior; but one by one the other bureaus, the Pension, Land and Indian offices have been crowded out until the Patent Office is now in sole possession, witb tbe exception of the small space occupied by tbe Secretary and his assistants. But the demand for room is as pressing as ever. The records, the copies of patents wbich must be consulted and removed in the daily work, are piled on huge sbelves in the corridors, and scattered all over tbe building, so that those who wish to search through them are confronted with a problem only a little less difficult than the finding of the proverbial needle in the haystack. When it is remembered that six or eight hundred patents are issued each week, and that the law requires 50 copies of each patent to be printed, it will be realized what the accumulation must be. The officials are at their wits' end to find place for them, and serious delays are caused by the lack of order and system which is an inevitable consequence of the congestion. In some branches, it is necessary to wait as long as two days before the desired copies can be obtained.

A bill was introduced by Senator Daniels of Virginia several years ago, to purchase a site immediately north of the Library of Congress for the location of a building for the Patent Office. The cost of the ground with a suitable building thereon would not exceed the amount of the net surplus, above stated; the site would be accessible, being very close to the Union Station, and would be comparatively free from noise. It is true that the plan does not harmonize with the accepted scheme to locate all government buildings on the south side of Pennsylvania Avenue, but it would serve to properly fill out the group of beautiful structures that surround the plaza on the east front of the Capitol. On the whole, there would be no real objection to the location proposed. In view of the time that would be necessarily consumed in condemnation proceedings, clearing the land and erecting the building, the work should be sanctioned and started at this session of Congress. It is to be feared, however, that the cry of economy which has become the watchword of this Administration, will prevent the enactment of this well deserved legislative measure It will probably be years before Congress wakes up to the necessity of taking action in the matter. Meanwhile, no one knows what will be the next step to relieve conditions in the Office, three years hence. It is overflowing its present accommodations like yeasty dough, and it is hardly to be expected that a new building will materialize within the coming decade.

New Phases of Copyright Law.

Suggestions for Amendment of Patent Laws.

We have already commented on the copyright law which went into effect July 1, 1909, but it is such a comprehensive act and so complete in its provisions, that it affords an almost inexhaustible topic. For years, repeated efforts had been made to change the old copyright measure, but as is always the case with new legislation, several sessions of Congress were required to perfect and pass the amended Act. The result, however, is satisfactory. The way in which infringements are treated under this law is especially worthy of attention. The specific, carefully worded provisions would lead us to think that the legislators determined to make the Act so plain that no opportunity for judicial construction would be left. Witness Section 25, which enumerates the penalties for infringing a copyright.

First and foremost, the copyright owner is entitled to an injunction restraining tbe infringement. In addition, the infringer must pay the copyright proprietor such damages as the latter may have suffered through the infringement, as well as all the the profits which he himself may have gained therefrom. And in proving the profits, the plaintiff is required to show sales, only, putting on the defendant the onus of establishing every element of cost which is claimed. Not satisfied with this, the section of the statute referred to further defines what may be regarded as proper damages in particular cases. For instance, a newspaper reproduction of a copyrighted photograph is liable to damages not to exceed the sum of $200 nor to be less than $50. In the case of a painting or piece of sculpture, tbe copyright proprietor is entitled to claim $10 for every infringing copy made and sold by, or found in the possession of the infringer. In the case of a lecture, sermon or address. $50 is assessed for the infringing delivery: for a dramatic or orchestral composition, $100 for the first and $50 for every subsequent infringing performance; for other musical compositions, $10 for every infringing performance; and so on throughout the statute. Each particular subject is treated in detail and the penalties marked out, so that even the layman can estimate the cost.

But this is not all. Section 40 prescribes that "in all actions, suits and proceedings under this Act, except when brought by or against the United States or any officer thereof, full costs shall be allowed and the court may award to the prevailing party a reasonable attorney's fee as part of the costs." Imagine this provision in regard to the attorney's fee being incorporated as an element of the costs in a patent suit! It would most materially decrease patent litigation.

It is a well known fact that in a patent suit, the injunction is the principal point gained. The assessment of damages to the patentee, or the determination of the profits of the infringing party, entails such heavy extra expense, that unless the prospects are alluring, tbe complainant is content with the injunction.

One would naturally suppose that after tbe patent has been declared valid and infringed, the question of the damages or profits could be easily determined. The patentee cannot, in patent law, collect both damages and profits. He may recover the amount of the profits which the defendant derived from his infringement, or he may recover full damages for the pecuniary loss which the infringement caused him to incur. If the infringer realized no profits from the infringement, none can as a matter of course be collected, and the plaintiff must then depend upon the damages for indemnity. Where there is an established royalty charge, this is a measure of the plaintiff's loss; but when no such charge can be shown, it is a difficult matter to prove the exact amount of the damages.

When the court has once decreed the patent valid and infringed, the determination of the profits or damages is referred by the Judge to an officer of tbe court known as the Master. He charges as a rule not less than $25 a day for hearing testimony on the question, so it is obvious that prolonged hearings before this officer will substantially add to the expense of litigation. Attorneys charge from $35 to $75 a day for their services, and the damages that may finally be collected will, in many cases, hardly cover the cost of the whole proceeding. It would be difficult to provide in the patent statute, as in the copyright law, specific regulation as to the amount of damages in every case, but there would seem to be no reason why the counsel fees should not be considered as an element of the costs, to be assessed on the losing party. An amendment of this character to the present law would go a long way toward putting a stop to certain phases of patent litigation. If a manufacturer knew that a decision against him in a suit for infringement would result in his paying not only the court costs but the attorney's fees as well, he would not be so ready to defy the warnings of the patentee against infringement. Some radical reform must be effected in the curtailment of the abuses of patent litigation, if there is to be a genuine response to the movement which President Taft has started, toward bringing justice within the reach of the man with moderate means.

SCIENTIFIC PROGRESS.

Air Gun.

Everyone knows the toy air gun, and it is surprising that the principle has not ere this found a wider application. Compressed air has almost limitless possibilities, and the very latest utilization of it is in a rapid fire gun which is not a plaything. Cartridges are not used, but balls, which are dropped. The air is compressed by operating a crank which both compresses and releases it in the chamber where the hullet has dropped. The missile is discharged with tremendous force, enough to pass entirely through a man's body.

Fly Trap.

A fly trap invented by a Kansas man will catch, he claims, 10.000 flies an hour. It consists of a wheel, designed on the order of the wheel of a paddle steamer. One critic describes it as a treadmill operated by the fly to his own destruction. The wheel is so delicately adjusted that it revolves with the weight of a hair, and a single fly starts it spinning. The inventor, who has made a long and patient study of the insect, says that the paddles of his wheel offer a resting place which the ordinary house fly cannot resist. They alight on the paidle, and before they know where they are the wheel spins round and drops them into a wire cage. When this receptacle is as full as desired, it is dipped into gasoline, and the lives of the microbe-bearing prisoners snuffed out.

To Harness the Tides.

The incalculable power wasted in the ebb and flow of the tides throughout the world has long been coveted by industry, and many have been the efforts made to utilize it. None of the appliances devised has been entirely successful, as the problem presents special drawbacks, The latest invention, however, is promising. Heretofore the attempts in this direction have been mostly to convert the power of the waves into electrical energy. The new plan is to have the tides compress air, which may be used in a compressed air engine. The inventor employs an inverted tank, the lower end being placed below the water level and the whole secured so that the water cannot dislocate it. When the water rises the air within the tank is compressed, and by means of valves is carried into a compressed air engine. Of course, a series of these tanks is used, and when one of them becomes filled with water an automatic shut-off is closed, and another tank is placed in operation. When the tide goes out, the receding water leaves a vacuum at the top of the tank, and the motor is then converted into a vacuum machine. In order that continuous work may be done, reserve chambers are installed for storing up compressed air. The very simplicity of the plan would seem to recommend it; and direct utilization of two of the elements, water and air, would open an unbounded field of activity.

Uses of Cactus.

While we may never succeed in gathering grapes from thorns, the prickly pear, or cactus which grows in the arid plains of our southwest and was once supposed to be merely a pest, is developing surprising possibilities. In Mexico, the cactus is regularly cultivated, and the fruits are eaten raw as well as used for the manufacture of a kind of cheese and honey. To make the honey, the juice of the fruit is boiled in kettles until it reaches the consistency of molasses, and then is poured into wooden troughs to cool, after which it is stored in bottles and earthen jugs. Thanks to the boiling, it is completely sterilized, and being tightly sealed and rich in sugar, it will keep indefinitely.

One variety of the cactus is called the cardona, and the fruit of this is highly prized, the natives employing it for both food and drink, as the pulp is nearly all water. In the structure of the cardona, the walls of the cells that hold the juice are very thin, so that there is only a small amount of fiber. By pressing the pulp in muslin bags, practically all of it can be forced through, leaving the seeds. Perhaps the greatest objection to these cactus fruits lies in the abundance of the seeds, but persons accustomed to eating them raw do not seem to object.

Sometimes a fermented drink is made from the pulp. It is boiled for several hours and cooled. The longer it stands the more intoxicating it is. Or the boiling may continue until the liquid is reduced to a sort of paste, which is solid as sweetmeat. The juice of other varieties will, it is thought, have important commercial value as a vegetable coloring, its hue being as rich as that of cochineal. The leaves of the plant may also be eaten as greens, or fried as egg plant. But the latest discovery is the existence of a queer little cactus that resembles a small radish covered with sharp prickles. In the top of each plant is a peculiar tuft about an inch in diameter, which when dried has somewhat the appearance of a button. One of these buttons put into the mouth quickly softens, the taste of it being rather unpleasant; but two or three, when chewed and swallowed, will produce a strongly tonic effect, engendering visions somewhat like those produced by hasheesh. The Indians of that region eat the buttons on occasions of religious ceremonial and regard the consequent dreams as revelations from the divinities they worship. Specimens of the buttons have been analyzed, and have been found to contain a hitherto unknown alkaloid, separated out in white needle-like crystals, which, it is thought, may prove of important medicinal value.

The Carnegie Institution has opened an agency near Tuscon, Ariz., the business of which is to make a study of desert plants, to find out how they manage to get along with so little water. The problem of storing a supply of water for their own use and of preventing its evaporation has been solved by these plants in the most ingenious ways. Perhaps the most noteworthy example is the so-called "water barrel." This is about the size and shape of an ordinary beer keg, and is in fact nothing more nor less than a living water tank. Its whole interior is composed of storage cells so admirably arranged that the pulp which they form contains something like 96 per cent of pure water. The water indeed is of pure quality, and access to it is easily obtained by cutting off with a machete the top of the barrel, which is covered all over with formidable spikes and hooked spines, evidently designed to protect it against destruction by animals.

Submarine Mines in Warfare.

The nations of the earth are ever inventing new weapons of battle, and among these the submarine mine holds no unimportant place. These mines were used half a century ago—during our own Civil War, in fact—but the ones then employed were toys compared with the fearfully ingenious engines of war that the world now knows. The simplest form of all mines is the contact, which explodes at the slightest touch. In construction it is merely an iron case holding five hundred pounds of explosives, with a cable attached to an anchor that holds it in place. This case has a number of projecting points, on the ends of which are firing pins. When a vessel strikes one of these pins, it is driven in, explodes a percussion cap, and thus bursts the charge of dynamite.

In anchoring these mines, great care is taken not to place them too near the surface. A depth of at least 10 feet is necessary, and as a strong current may force them down so far as to render them useless, ground mines are often placed on the bottom. These contact mines have a bad habit of going adrift, in which case woe betide the vessel that happens upon them. That they can destroy both friend and foe was shown in the Russo-Japanese war.

The observation mines are more generally used. In these the firing mechanism and the mine proper are in separate cases. Should a boat strike this sort of mine, the firing pin closes the signal circuit, so that a bell is rung at the station on shore. The signalman knows from hearing a certain bell that the buoy above the corresponding mine has been struck, and he touches a key that closes the firing circuit and causes the mine to explode.

To fire mechanical mines, two methods are employed: A glass tube containing sulphuric acid is placed so that it will be broken by the jar when the mine is struck and allow the acid to come in contact with potassium chlorate. The heat of reaction causes the explosion of the charge. The second method is an arrangement of pistol and ball so that the ball will he thrown against the pistol trigger when the mine is struck and cause a shot to be fired into the charge, exploding it.

The explosives used in submarine mines are black powder, dynamite and wet guncotton—preferably the two latter. In selecting explosives the three greatest requirements are: retention of strength regardless of weather conditions, such as freezing and thawing, lapse of time, and occasional saturation with water: convenience in loading—involving safety in transport and handling—a form which admits of easy insertion in a hole small enough to be made watertight, and has high density in small bulk; and the greatest possible effect when fired under water in such envelopes as are suitable for submarine mines.

According to an official of the coast artillery corps, the cost of mine defense is a mere bagatelle compared with that of any other. The entire material to protect all the harbors of the United States would cost but little more than $4 000 000, which is less than the expense of one first-class battleship.

Flourless Bread.

Can it be that an invention of two Frenchmen is destined to make the miller merely a figure in legend, together with the fuller and tallow chandler? It may be some time before he is regulated to oblivion, but the new French machine is interesting as a curiosity at least. All you have to do is to drop the shelled wheat into a hopper, turn a crank, and dough will come out. The wheat has to be soaked before it is placed in the machine, but once soaked, it is ready to be dumped in along with some salt and yeast. Then you use your muscle on the crank, and the first thing you know, a worm of dough is creeping out of the other end of the "panificator" as they call the invention. It is just as simple, says the *Pathfinder*, as one of those sausage machines in which we are told the good equine or even canine meat enters, soon to emerge as the best sort of Hamburger steak. A series of screw threads crushes the grain and grinds it thoroughly, and when it passes from the screws, it reaches a space between the gliders where it is well kneaded, being kept cool during the whole process by means of a current of water which is sent through the interior of the machine.

As soon as the dough emerges, it is placed in baskets, which are covered with woolen cloths and allowed to stand in a warm place. When the dough begins to rise, it is divided into loaves and placed on tables covered with warm cloths. presently to be put into an oven and allowed to remain from 40 to 45 minutes. Bread made in this way has a very thin crust. The odor is appetizing. The advantage claimed for the process is that it enables the consumer to secure a whole wheat loaf, the inconvenience of bran being obviated because the whole grain of the wheat is reduced to a homogenous mass.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Pipe-section mold, Curved....W. S. Sigler
Pipe-threads and like work, Machine for chasing....W. T. Johnston
Pipe-wrench....J. E. Richards
Pipes, Transporting-bar for....W. S. Sigler
Pipes, Machine for making making continuous....R. F. Dockery
Panetarium....F. J. & W. F. Trippensee
Planter marking attachment, Corn....L. P. Lewis
Plastic material into charges, Machine for dividing....G. E. Gowdy
Plastic material, Machlne for dividing....G. E. Gowdy
Plastic materials, Nested dies for forming bodies from....P. J. Fish Sr
Plate-holder....L. M. Siegel
Plunger mechanism for jig-tanks....G. H. Elmore
Potato-hook rahe attachment....C. Kropp
Powder-box cover....G. Messinger
Power-controlling apparatus....W. R. McKeen, Jr
Pressure-regulator....H. F. Smith
Printing and delivering apparatus, Coupon....J. W. Jones
Printing-machine....J. L. Firm
Printing mechanism....E. W. Dean
Printing-press folding appatatus....H. F. Bcechman
Propeller....2 pats....M. D. Thompson
Protectors, slugs, or fasteners, Machine for inserting....M. F. Brogan
Pump....C. R. Green
Pumps, Automatic stea....W. S. Ferguson
Pumping-engine, Steam....M. W. Hibbard
Punch-cutting and like machines, Blank-holder for....F. H. Pierpont
Punch-cutting and like machines, Cutter-head mechanism for....F. H. Pierpont
Punch-cutting and matrix-cutting machine....F. H. Pierpont
Punch-cutting machines, Cutter for....F. H. Pierpont
Punching-machine....J. L. Bernard
Pyrometer or heat-measuring device, Mechanical....J. L. Zander
Rail-anticreeper....A. O. Buckius, Jr
Rail-clamp....J. C. Crowson
Rail-joint....A. H. Newpher
Rail-joint....H. Protheroe et al
Rail joint and fastener....H. H. Markland
Rail-joint and tie-bar and nut-lock....C. G. & M. K. Gross
Railway composite cross-tie....O. Gerlach
Railway danger-signai mechanism....R. E. Murphy
Railway, Pleasure....H. Whiting
Railway-rail support....A. Neusus
Railway-swith, Automatic....W. L. Kubach
Railway-tie....P. S. Torrance
Railway-tie....G. Lemieux
Railway-track construction....A. J. Coover
Razor, Safety....J. R. Gilda
Razor, Safety....W. L. & E. J. Nahm
Razor-stropping device....M. Gallas
Reels, Making grading....F. Prinz
Refrigerating apparatus....R. H. Thomas
Regenerativc reversing-furnace..2 pats....L. L. Knox
Regulator....R. S. Dimond
Rerolling metal shapes from old railway-rails....J. E. York
Retort-charger....A. S. B, Little
Rings from tubes, Machine for turning....W. D. Mitchell
Rivet....W. C. Bray
Road-machiue....M. & M. Pampl
Roasting apparatus, Grain and seed....G. W. Barth
Rcck-drilling machine or engine....L. E. Scott
Roast, Chicken....J. L. Herman
Rotary engine....F. H. Leftwich
Rotary engine....C. A. Burrows
Rotary motor....W. S. Elliott
Rotary table....J. F. Beatty
Rug-hanger....M. Braymes
Rule, Flexible slide....R. J. Roberts
Running-gear....C. O. Wyman
Salts, Neutralizing solutions of....B. Diamond
Saussage twisting and linking machines....W. J. Collins
Saw-guide for ax-handles....C. D. Bryant
Saw, Hand....K. Ziegler
Saw. Metal.cutting....W. H. Lucas
Saw-setting machine..3 pats....H. Watkins
Sawing machine, Wood....T. Kimura
Scale. Computing....L. C. Wetzel
Scale-spring hanger....L. Wilson
Scale, Weighing....2 pats....J. E. Cochran
Scales, Weight-recording means for weighing....G. Guldbrandsen
Screw-driver....J. B. Ruple
Seal, Box....W. M. Brooks
Sealing means....F. A. Winslow
Seat attachment....J. Nause
Seed conveyer, Cotton....D. H. Greeson
Self-playing-instrument web-controlling mechanism....C. H. Hamilton *et al*
Selling liquids, Automatic machine for....A. Meinert
Separating mechanism....J. Loufek
Sewage-discharge system....T. Ferguson
Sewing-machine guide for hat-sweats..J. C. Ringe
Shade and fixture, Window....C. V. Hughes *et al*
Shade and screen for windows, Combination....C. Y. Hughes and J. M. Robinson
Shade-bracket....L. E. McCahan
Shade-roller....W. D. James
Shade support, Window....C. C. Brown
Shaper-head....G. V. Fellows
Shaping-machines, Combind guard and chip-breaker for....W. S. Richards
Shears or the like....F. D. Davies
Sheet-feeder....A. J. Hodge
Sheet mctal into irregular jorms, Machine for cutting....A. W. B. S. Rohde
Sheet-metal socket....E. L. Watrous
Sheet of material, Composite..L. S. & M. Samuel
Shelf-bracket....R. R. Kintz
Shock-loader....J. B. Schuman
Shovel, &c., handle....H. S. Urban
Show-rack....O. W. Winston
Sifter, Ash....H. L. Hastings
Sifter, Ash....C. Wolfenden
Signal secorder, Electric....N. H. Suren
Signal system....W. Mears
Signaling system....O. M. Leich
Signaling system, Electrical....F. M. Slough
Skate, Combined roller and icc....J. A, Nolan
Skirt-supporter....C. B. Patterson
Sled, Bob....N. Koopman
Sled, Folding or collapsible....W. H. Coleman
Small-arms strikers or firing-bolts, Automatic safety device for....J. Tambour
Smelting, Electric....E. R. Taylor
Smelting-furnace, Electric....E. R. Taylor
Smoking-pipe and making same, Corncob....T. J. Tyner
Sounding-tackle....O. Gutt *et al*
Spark-plug....O. C. Winestock
Spark-plug....W. S. Bechtold
Spark-plug....F. H. Winehauer
Speedometer....E. Schneider
Spinning, doubling, and like tcxtilc machine....S. Z. de Farranti
Spinning-ring base....M. H. Maloney
Spoke-fastener....W. L. Jett
Spout....E. L. Watrous
Sprayer....E. Harry
Spraying apparatus....A. G. Stout
Stake. Spring....M. R. Jenkins
Stamp, Canceling....E. Z. Wilkoshesky
Stamp, Time....J. J. Busenbenz
Steam, Apparatus for utilizing exhaust....H. H. Wait
Steam-equalizer....H. H. Wait
Steel, Producing and refining....F. C. Perkins
Step or running-board....G. W. Morse
Stereotype plate and base, Separable....A. F. Herbsleb
Stitch-separating machine....F. P. Taylor
Stitching apparatus, Book....M. Christensen
Stone, Manufacture of artificial....W. Lake
Stool....F. K. Crumb
Stove and water-boiler, Combination gas....R. Schneider
Stove, Folding camp....C. L. Swinney
Stove, Gas....J. I. Orkin
Strainer....T. Richardson
Strainer for coffee-pots....J. E. Willetts
Street-sweeper....M. F. Adkins
Sugar from whey, Extracting milk....J. A. R. Nilsson *et al*
Sugar, Producing from ligno-cellulose fermentable....M. F. Ewen *et al*
Superheater-boiler....E. H. Wells
Switch....A. G. Rhodes
Switch mechanism, Electric....J. G. Peterson
Switch-stand....S. K. Blair
Tag-fastener....G. A. Wadsworth
Tag, Shipping....J. W. Foster
Talking-machine....L. P. Valiquet
Tape, Loop....L. M. Victorius
Target-practice aiming-machine....C. Monroe
Teeter-board, Revolving....R. Barrett
Telegraphy....J. F. Richardson
Telephone-exchange system and apparatus....R. H. Manson
Telephone-registers, Locking and signaling system for....A. S. Spiegel
Telephone repeater apparatus....N. G. Warth
Telephone service, Apparatus and system for measuring....S. H. Browne
Telephone-switchboards, Wiring....C. S. Winston
Telephone system....O. M. Leich
Telephone-transmitters, Appliance for use with....C. J. Kintner
Test-indicator....P. G. Wheeler
Thread-board....W. O. Aldrich
Threshing-machine....2 pats....R. W. Gotshall
Threshing-machine cleaning and sorting device....G. Erlinger, Jr
Tie-plates, Manufacturing....E. H. Bell
Time-recorder....2 pats....W. H. Bundy
Timer and distributer, Combined....C. T. Brown
Timing-machine for use in pigeon-races, &c....W. McMillan
Tire-armor....R. E. Johnson
Tire armor, Pneumatic....L. W. Galloway
Tire-bolt wrench....G. Lindahl
Tire construction....G. E. Garon
Tire detachable tread, Automobile..T. M. Davey
Tire, Resilient....H. Klingler
Tires, Means for holding and inflating pneumatic....F. W. Stanley
Toaster....W. J. Stewart
Tobacco-leaf-feedlng device....L. P. Whitaker
Tobacco, Renovating, cleansing, and aromatizing....S. B. Heddles
Toe-tip protector....G. S. Burgan
Tool....E. Bartels
Tool....J. Spaar
Tool....C. F. Riesenweber
Top-lift-flattening machine....A. J. Bolton
Torches, Air-pump for blow....O. Bernz
Toy....R. R. Essig
Toy, Figure....G. T. Hall
Toy, Mechanical....E. Eastman
Toy rifle, gun, and like arm....G. Schrodel
Tracc-releaser....W. J. Parvin
Transformer....F. M. Slough
Trigger mechanism....E. R. Williams
Trigger mechanism, Singlc....P. H. Robinson
Trelley....O. W. Brenizer
Trolley-pole....J. Harsen
Trousers....F. H. Sprague
Trowel....P. Neerup
Truck....S. Craig
Truck lateral-motion roller-bearing device, Car....J. C. Barber
Trunk-tray support....C. F. Rom
Tubc-mill cement-feeder....A. E. Sparrow
Tunnel, Subaqueous....E. W. Moir
Turbine, Elastic-fluid....F. Hodgkinson
Turbine, Elastic-fluid....S. Z. de Ferranti
Turbine-muffler and fly-woeel, Combined....J. A. Lawson
Typewriter attachment....W. A. Tompkins
Typewriter keyboard-lock....W. P. Kidder
Typewriting machine....A. T. Brown
Typewriting machine....A. W. Steiger
Typewriting machine....F. J. Tanner *et al*
Typewriting machine....J. B. Secor
Typewriting machine....L. D. Broughton
Ultramarines, Manufacture of....F. Bellet
Umbrella, Folding....J. T. Manning
Valve....H. Gibbs
Valve....F. Schreidt
Valve....C. Wainwright
Valvc, Air-brake safcty....O. Gibson
Valve, Barrel....C. F. Terney
Valve, Check....H. F. Cunning
Valve, Engineer's....W. Ohlsen
Valve-gear....A. M. Wolf
Valve-gear for explosive-engines....A. A. Karcher
Valve, Pressure-regulating....H. F. Cunning
Valve, Safety gas....F. D. Gregory
Valve, Vacuum air....C. A. Dunham
Vapor-burner....R. C. Bierbower
Vault, Burial....H. Lanius
Vault, Burial....G. Hess
Vehicle-brake....R. R. Hart
Vehicle, Dumping....C. Miller
Vehicle-fender....C. W. M. Guhle
Vehicle, Motor....H. Pieper
Vehicle motor fore-carriage....E. Vignie et al
Vehicle-reach....M. R. Hull
Vehicle-ventilator....F. R. Harvey
Vehicle-wheel....E. Hartman
Vehicle-wheel....E. Hopkinson
Vehicle-wheel....L. M. Wolffsohn
Vehicle-wheel....W. D. Trigalet
Vending-machine, Coin-controlled....H. A. Ladue
Vending-machine coin-controlled mechanism....J. Fritsche
Vending machine, Bicture....T. R. McQuillan
Vent, Sanitary....W. S. Tuttle
Ventilator....H. F. Marvanville
Vibrating, tension, and operating table..J. Lend
Violin-tuning peg....P. Rose
Voting-booth....E. Hinton
Voting-machine....2 pats....J. H. Dean
Wagon-brake....E. A. Johnson
Wagon-runner....F. Kindahl
Wagon, School....T. H. Parry *et al*
Wagon shock-loading attachment, Farm....F. X. La Londe
Wall, Retaining....M. M. Upson
Warp-carriage....M. D. Colman
Warp-frame....W. L. Dorr
Washboard....J. E. Byrnes
Washer....H. A. Davis
Watchmaker's tool....C. H. Pratt
Water-elevating apparatus....O. A. Roed
Water-elevator....J. Montgomery
Water-heater, Electrically-operated....J. A. Hunnewell
Water-heating apparatus..2 pats..A. C. Dunham
Water-purifying apparatus....H. Reisert
Water-tube boiler....H. F. Ely
Weather-strip....W. C. F. Beale

Weight-indicating mechanism.. A. Heimann *et al*
Welding machine, Chain..... F. H. Howard
Wheel.....E. Stewart
Wheel.....G. H. Treadgold
Whiffletree, Quick-releasing.....E. A. Carkin
Window-balcony, Portable.....T. Hull
Window ventilating device.....C. V. Walker
Wire-stretcher..... W. W. Snyder
Wire-stretcher.....-J. R Wade
Wood, Bending.....J. T. Breece
Wood, Preserving W. A. G. von Heidenstam et al
Wrench.....D. W. Shaffer
Wrench.....C. Sauer
Wrench.....E. D. Hamilton
Wristband.....H. J. Collis
Yoke, Neck.....G. E. Wheeler

DESIGNS.

Bracelet, Rosary.....K. Beetar
Paper-lace mat.....R. Gair
Sheet-metal plate.....T. Cohn

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MECHANICAL PATENTS.

Acid, New mercury salt of para-animophenylarsinic .....J. Altschul
Adding-machine.....F. R. McBerty
Adding-machine actuating mechanism..... .....C. P. Wetmore
Advertising hat-rack.....B. Klum
Air-compressor, Compound.....N. A. Christensen
Alloys, &c., Manufacturing calcium-silicon..... .....H. Goldschmidt and O. Weil
Ambulance.....C. Mestrovich
Anthracene compound, 2 pat..P. Thomaschewski
Arch-centering form, Collapsible.....A. R. Smith
Asphalt, Rejuvenating.....J. A. W. Pine
Assaying composition.....J. C. Hames
Atomizer.....T. A. De Vilbiss
Auger, Coal-.....C. R. Anderson
Automobile driving-gear.....E. G. Whitacre
Automobile touring-map carrier.....H. Dalitz
Axle and making same, Steel car-..... .....A. C. Cunningham
Axle lubricator, Car-..T. Hardy, Jr., and A. Droll
Baby-cloths, Receptacle for.....C. Brewer
Balloon, Dirigible.....B. D. Reese
Band-cutter.....J. B. Deane
Barrel head and hoop fastener.....Z. Dixon
Basket.....C. S. Mooney
Baskets, boxes, &c., Corner-iron for.F.W.Goedeke
Battery-contact.....J. H. Gugler
Bearing, Antifriction-.....I. Moss
Bearing, Roller-, 2 pat.....O. E. Michaud
Bed, Folding wall-.....W. C. James
Bed-spring.....J. Sirr and J. W. Kleine
Beer bottling.....R. Gull
Beer, Bottling machine.....R. Gull
Belt-coupling..... ..G. E. Purple, A. B. Beach, and W. H. Trout
Belt-coupling.....G. E. Purple
Belt-sander.....O. Olsson
Belt-shifting mechanism.....A.A.Wood
Belt, Sorting-.....O. Sutter
Bench-clamp.....R. T. Bond
Bench-stop.....M. R. Raynesford
Bending-machine.....R. A. Carter
Berth, Sleeping-car.....A. West
Bevel, Jack-rafter.....C. F. Reum
Binder.....H. V. Wagoner
Binder, Loose-leaf.....E. P. Webster
Binding-post.....H. E. Leppert
Blower, Air-flue.....L. Lunstrum
Book, Check-.....C. S. Sultser
Book, Folding check-.....C. S. Sultzer
Book, Manifolding-.....B. C. Maxwell
Book or pad, Manifolding, 2 pat...B. C. Maxwell
Book, Pocket check-.....C. S. Sultzer
Bottle-capping machine.....R. L. Shriner
Bottle-capping machine.....C. Kirkegaard
Bottle-closure.....F. W. H. Clay
Bottle-closure....R. M. Cauffman and W. Best
Bottle, Non-refillable.....M. Raymond
Bottle, Non-refillable.....R. Riegel
Bottle, Siphon-.....P. Devarco
Bowl, Sugar-.....C. T. McCreery
Box.....M. M. King
Box.....J. H. Baker
Box.....G. B. Reed
Brake-beam.....C. H. Williams,Jr.
Brake-head, Adjustable.....W. A. Robischung
Brake-mast.....H. C. Ostermann
Brake slack-adjuster, Automatic..R. F. Hamilton
Brick-press.....S. J. Pink
Bristle-drying machine.....E. R. Zehner
Broom-head cover.....O. T. Merkle
Brush.....F. D. Wolfgram and E. Klausman
Brush.....E. E. Ahlstedt and A. L. Bowman
Buckle and clasp, Combined.....M. F. Burns
Buckle, Cross-line.....W. D. Wise
Building-blocks, Musical.....A. A. Giffin
Building structure.....V. Font
Burner.....H. W. Schoff
Bust-pad.....A. C. Henderson
Butter and lard cutter.....C. H. Carlson
Butter, Apparatus for the continuous manufacture of.....A. H. Borgstrom
Buttonhole attachment, Substitute..F. Robertson
Cable traction apparatus.....C. J. Eastman
Cables, Clamping mechanism for litter-supporting .....W. Gutenkunst
Calculating-machine.....J. Bricken
Calculating-machine, 2 patents.....R. Rein
Can-caps, Machine for applying cement to..... .....W. F. Butler
Can-cover-coating machine..... G. W. F. Weber,F. Eberhart,and E. V. Swangren
Can cutter and tapping valve, Oil-..W. M. Curtis
Can drier, Labeled-.....R. Schilling
Can neck and making the same, Milk-..R. Bray
Candlestick, Miner's.....C. Fisk
Car-brake.....N. P. Zech
Car-door and means for operating it..W. M. Smith
Car-door for grain, coal, &c.....R. R. Reaveley
Car, Dump-.....C. H. Clark
Car-fender.....G. A. Etsler
Car-grain-door lock, Box-.....C. O. French
Car, Railway motor-..W. S. Hovey and M. H. Rix
Car-track-sanding device.....W. E. Fielding
Car-underframe bolster construction....F. Koch
Car-wheel and mounting.....T. Donohoe
Carbid and manufacturing same..H.L.Hartenstein
Carbureter.....S.W.Rapp
Carriage-top.....W. Woop
Carton.....G. W. Teasdale
Cash-register.....E. J. von Pein
Caster.....E. H. Humphrey
Caster.....B. H. Noelting
Caster, Furniture-.....E. H. Humphrey
Casting metals, 2 patents.....W. G. Nichols
Casting plant.....C. W. Sherman
Catamenial bandage.....C. B. Cahoon
Cement and other products, Making..S. Peacock
Cement sidewalks or similar structures, Apparatus and process for laying.....A. D. Nay
Chair.....M. Thum
Chair attachment, Barber-.....T. G. Aitkin
Chair-seat.....A. Wanner, Jr.
Chalk-holder....C. V. Norman and G. Peterson
Channel-bars with taperless flanges, Making..... .....H. Sack
Chuck, Automatic.....H. O. Evans
Chuck, Drill-.....H. N. Kennedy
Chuck, Drill-.....C. F. Schultis
Chuck, Lathe and drilling.....W. Kleber
Clamping device.....J. W. Higgins
Clevis-hook, Whiffletree.....W. S. Thomson
Clothes-line hanger.....C. C. Lovejoy
Clothes-line reel and tightener.....R. M. Kneisley
Clothes-line tightener.R.C.Scheurer and L. Marek
Clothes-press, Steam.....A. J. Hoffman
Cluster, Wireless.....R. B. Benjamin
Clutch-actuating mechanism..B. M. W. Hanson
Clutches, Duplex thrust device for friction-..... .....A. Lambert
Coal-loading apparatus.....W. Larsen
Cock, Ball-.....W. J. Frost
Coffee-machine.....C. Nelson
Coin-holder.....A. R. Voliva
Coke-oven, By-product retort.....H. Prentice
Coloring-matter, Vat, 2 patents.....J. Deinet
Comfortables, Sanitary washable case for..... .....A. C. Caldwell
Communication, Selection in syatems of, 2 patents .....E. E. Clement
Communication, Selective apparatus for systems of .....E. E. Clement
Computing-machine-check-stamping mechanism.. .....G. A. Armstrong
Computing-table.....E. Aberle
Concrete construction.....C. E. Brockhausen
Concrete-molding machine, Combination..... .....J. H. Wiest
Concrete partition, Reinforced-....G. M. Graham
Concrete receptacles, Form or mold for..... .....R. C. Morris
Concrete shingle.....J. H. Wiest
Concrete structure, Reinforced....G. M. Graham
Concrete-structure reinforcing-frame..... .....G. M. Graham
Concrete-structures, Erecting reinforced..... .....G. M. Graham
Concrete-wall construction.....J. Macbeth
Condenser.....C. J. A. Gottlieb
Cooling system.....L. L. Bogue
Copy-holder.....I. H. P. Colleen
Corn-shocker.....I. T. Leager
Corner-pieces, Machine for cutting and trimming the edges of.....C. J. Lysaght
Corner-pieces, Machine or apparatus for creasing the edges of.....C. J. Lysaght
Corset-clamp.....S. E. Florsheim
Cotton-chopper....J. D. Armstead and S. Kelley
Cotton gathering and gleaning machine..... .....O. C. Houghton
Couch fabric.....C. H. Gail
Countersink attachment.....S. Lindstrand
Crane, Horn-.....T. J. Beetham
Crank, Safety-.....C. C. Ilg
Crate.....G. E. Richmond
Crow-call.....C. H. Perdew, Sr.
Crusher-head, 2 patents.....R. Bernhard
Curtain and shade hanger, Combined window.... .....J. W. Henley
Curtain-hook.....O. F. McCall and C. L. Taft
Curtain-pole.....C. C. Schell
Curving machine, Sheet-material-....C. N. Frey
Cushion for the bottoms of chair-legs, &c..W. Maier
Cushion-wheel.....A. Ellis
Cuspidor.....G. R. Teschel
Cuspidor.....D. V. Haddock
Cut-off, Water-spout.....G. Henkel
Cutting machine, Sheet-material-....A. F. Preston
Dental instrument.....E. L. Chott
Desiccating-machine.....E. R. Fillmore
Desk.....N. E. Fealy
Die-stripper.....J. H. Ames
Dish-washing apparatus.....E. Aldrich
Display apparatus.....J. Gaynor
Display-can sheet metal.....J. Xavier
Door and window fastener, Sliding..... .....F. H. Schlapbach
Door-hanger.....G. T. Buddle
Doors, Combined roller-support and casing for edgewise-movable.....M. Kurtzon
Doors, screens, &c., Means for hanging....T. Gill
Doubletree.....G. M. Frink
Draft-equalizer.....A. V. Burke
Drier.....H. W. Shepard
Drill.....W. C. Whitney
Driven mechanism, Operating device for..... .....R. D. Tittle
Driving and reversing mechanism..F. A. Thurston
Driving mechanism, Friction.....R. and J. Lusse
Drum and cymbal beater, Bass-....A. C. Schipper
Dust collector and separator.....E. H. Frickey
Dust collector and separator.....O. Porbeek
Dye, Vat.....P. Fischer
Dye, Yellow.....P. Fischer
Dyeing apparatus, Hat-.....F. Bauer
Egg cabinet and testing attachment..F. J. Balgie
Eggs, Preserving.....W. H. Burns
Elastic wheel.....M. Schnabel
Electric furnace.H.Rochling and W. Rodenhauser
Electric-machine brush, Dynamo-....H. S. Miller
Electric machine, Dynamo-.....A. L. Cushman
Electric switch.....G. W. Hart
Electrical distribution system.....A. S. Hubbard
Electrical wiring on stand-pipes, Hood for..... .....J. Potterton
Electricity, Generating.....H. S. Blackmore
Electromagnetic device.....E. A. Brofos
Electromechanical device, 2 patents..G. H. Rowe
Elevating and lowering apparatus.E. P. Dandridge
Elevator locking mechanism.....G. F. Steedman
Embroidery-machines, Perforating or pricking apparatus for.....C. Moriggl
Envelop-clipping machine.....C. E. Campbell
Eraser.....J. S. Thurman
Eraser, Ink-.....F. M. Holder
Evaportaing apparatus.....S. M. Lillie
Eyeglass-mounting.....S. J. Clulee
Fan, pump and the like, Centrifugal...J. Kirby
Fans, Blade of centrifugal.....O. B. Jacobsen
Faucet and spigot attachment.....J. E. McLean
Faucet, Compound.....F. B. Hunter
Feed-water heater.....G. H. Gibson
Feed-water purifier.....F. Grieve
Fence clamp, woven-wire-.....J. Fisher
Fiber-cleaning machine.....L. L. Summers
File-holder.....W. C. Shank
Filling-machine.....J. F. Haller
Filter.....R. S. Browne
Filter.....L. W. and M. Andres
Fire-alarm.....W. Goodchild
Fire-escape.....A. Anderson
Fire-extinguisher and signaling system, Automatic .....R. B. Hewitt and J. G. Nolen
Firearm.....G. S. Lewis
Fish-tape coupling.....F. A. Swan
Fishing-reel line-guide.....W. A. Austin
Flash-light.....J. Anderson
Floor-scraping machine.....S. Drew
Fluid-controlling apparatus.....H. Sieben
Fluid-pressure combination-lock..W. J. Hofstatter
Flushing apparatus.....P. S. Millice
Flushing apparatus.....T. W. Christy
Flushing-tank.....C. M. Franzheim
Folding chair.....W. W. Dozier
Folding strap or brace.....G. C. Locklin
Foot-rest.....H. S. Phillips
Furnace.....J. C.-Osborne
Furnace mechanical charging apparatus, Blast-.... .....L. Geuze
Fuse, Electric time-..C. D. McPhee and J. Gillies
Fuse-holder.....J. E. Graybill
Game.....H. E. Hire
Garment.....C. T. Small and W. N. Shelton
Garment-supporting strap.....E. Morris, Jr.
Gas-burner.....W.F. Cobedesh
Gas, Manufacturing.....C. B. Tully
Gas plant, Peat-.....J. D. Oligny
Gearing.....A. D. Williamson
Gearing.....G. O. Leopold
Gearing.....J. G. Morrison
Gearing.....A. D. Williamson
Glass cylinders, Drawing.....H. A. Schnelbach
Glass-tank gathering-pool.....A. L. Schram
Go-cart.....E. C. Moore
Grab or draft hook.....D. A. Busch
Grader and drag, Road.....E. B. Fritchman
Grain cleaner and separator.....F. Grotenrath
Grass-catcher.....H. B. McGrath
Grinder, Portable and detachable disk-.J. C. Ward
Grinding and polishing roll.....A. Bevan
Grinding-machine.....G. Larson
Grinding machine, Lens-.....F. Buchhop
Grinding-mill.....J. Walker
Grinding solid bodies, Machine for..A. J. Ericsson
Grip device, Intermittent.....R. D. Tittle
Gun.....J. R. Crabtree
Gun-cleaning means.....R. A. Fessenden
Guns, Device for emptying the magazines of repeating shot-.....T. Hardy
Hair-drying apparatus.....W. A. Soles
Hair-pin.....B. L. Scott
Hair waver or curler.....J. R. Bux
Hammer and sight, Combined.....A. M. Powell
Harvester, Beet-.....H. V., O. S. and C. F. Lee
Harvester, Cotton-.....C. N. Goodwin
Hat-holder.....W. R. Evans
Hatch or manhole cover, Water-tight..... .....M. A. Laubeuf
Hay-carrier.....S. P. Lerch
Hay-press.....N. Piquette
Hay-press sweep.....N. Piquette
Hay-rack.....E. J. Wells
Hay rake and loader.....O. J. Olson
Hay rake and loader, Combined.....O. Boyer
Head-adjusting mechanism.....C. L. Grahmann
Headlight bracket and mechanism for turning same, Automobile-.....F. H. Aubeuf
Heel-sweep, Reversible and adjustable..... .....J. H. Brockman
Hinge.....J. L. Larkin and J. C. Woody
Hinge for doors, Spring-.....E. C. Scruggs
Hog-scraping machines, Beater for..... .....W. Gussenhoven
Horse-blanket.....J. W. Peirce
Horse-releaser....H. O. Stires and L. W. Smith
Horseshoe.....J. H. Hershberger
Horseshoe.....P. von Stettina
Hose-coupling.....W. F. Koper
Hose-coupling.....I. I. Rose
Hose-coupling.....J. E. Ward
Hose-coupling and gasket therefor....J. E. Ward
Hose-coupling, Train.....A. H. McMasters
Hub-attaching device.....I. S. West
Hunting-knife.....G. P. Riggs
Hydrocarbon-burners, Feed system for..... .....J. N. Leach
Ice-cream-mold gaging attachment..J. A. Aubry
Ice-making apparatus.....D. J. Havenstrite
Infant's band.....J. Gundel
Internal-combustion engine.....G. V. Benson
Jar-tray.....W. A. Lorenz
Jewelry-box.....L. E. Brown
Journal-box.....G. Frowen
Journal-box torsion-lid.....T. H. Symington
Key.....J. Blaszczyk
Kiln.....C. A. Matcham
Kinematograph and like instrument..E. A. Ivatts
Knitting-machine latch-needle.....R. W. Scott
Knob, Door-.....H. S. Lockwood
Knob-spindle, Swivel.....J. R. Fletcher
Knockdown box.....W. J. Neebes, Jr
Knockdown box.....W. L. Howland
Labeling-machine.....F. O. Woodland
Labeling machine, Can-.....G. F. Russ
Ladder.....J. W. Caldwell
Ladder, ironing-board, and clothes-rack, Combined step-.....J. Watt
Lamp (reissue).....H. F. Smith
Lamp-burner.....W. E. Gard
Lamp burner, Incandescent-.....A. A. Jahnke
Lamp-holding attachment for miners' caps..... .....C. R. Anderson
Lamp, Incandescent gas-.....J. Maas
Lamp socket, Cluster-.....R. B. Benjamin
Lamps, Adjustable suspension-cord for electric... .....T. W. Trotter
Last-lock.....F. J. Shainsey, Sr.
Lasting-machine, 3 patents.....C. F. Pym
Lathes, Feed for.....C. L. Libby
Leather-shredding mills, Attrition-plate for..... .....G. E. Sovereign
Lifting and lowering apparatus.....J. V. Vicksell
Lifting apparatus.....J. H. Gilman
Lifting-jack.....L. Willour
Lime and apparatus therefor, Burning..... .....H. L. Doherty
Linotype and other type-casting machines, Matrix for.....C. A. Albrecht
Liquid-cooler.....J. D. Hendrix
Liquids, Filling, storing, and discharging inflammable.....F. Clauss and L. Lweisson
Liquid-fuel burner.....C. A. [illegible]
Litter-carrier trip mechanism and [illegible] .....W. [illegible]
Lock.....H. [illegible]
Lock.....H. L. [illegible]
Lock.....H. Ecklaroe
Locomotive ash-pan.....R. W. [illegible]
Log-conveyor.....R. Groman and C. Henson
Loom.....J. Nazarian
Loom magazine, Weft-replenishing-...H. Wyman
Loom shuttle-picking mechanism....I. E. Palmer
Loom stop-motion.....O. A. Sawyer
Mail-bag catching and delivering apparatus..... .....T. F. Curtis
Mail-pouch-delivery apparatus..... .....C. W. Broughton
Mainspring-winder.....G. W. Bowers
Manifolding-pad.....B. C. Maxwell
Marine table.....A. H. Pence
Marker, Self-feeding.....A. G. Gunn
Match-safe.....F. Schille
Matches, Combined original package and safe for .....F. F. Tebobald
Mechanical movement.....G. W. Hart
Metal box or case, Folding.....F. Troelman
Metal molding.....P. T. Kenny
Metal plates, Apparatus for pressing parts of large dimensions from.....M. A. Bourgeois
Metal-working machinery.....C. E. Van Norman
Metal-working machines, Stop for carriages of..... .....B. M. W. Hanson
Metals, ores, &c., Working.....O. Frick
Metallic bodies, Method of and apparatus for testing and sorting.....J. A. Switzer
Metallic leaf, Package-roll of.....W. H. Cox
Metallic tie and rail-fastener.....L. McFarland
Metallurgical process.....A. G. Betts
Milk, Fibrous desiccated.....J. A. Just
Milk pasteurizer and filter.....C. C. Stambaugh
Milk, Utilizing dried.....J. A. Just
Milking appliance..... .....J. Henrichsen and C. J. Hemmingsen
Milking vessel.....S. W. Gerster
Mine-ventilator.....M. T. McDonough
Mines, Apparatus for recording bell or like signals, especially applicable to.....J. Russell
Mines, Priming charge for.....L. Cahuc
Mirror, Electric mouth-.....B. E. Turney
Mixing-receptacles, Hand.....A. Hallenberg
Moistener, Antiseptic finger-..... .....J. A. Sauer and G. E. Potter
Molding-machine.....C. Mills
Molding-machine.....C. W. King
Molding-machine.....V. E. Knecht
Mop head and wringer, Combined..L. J. Moody
Motion, Mechanism for converting rotatory into reciprocatory.....J. Myrholm
Motor conroller, Electric-.....F. Diehl
Muffler.....G. C. Hicks, Jr.
Nailer, Automatic clench-.....P. R. Glass
Nautical instrument.....C. A. McCallister
Navigation apparatus.....W. J. Chance
Necktie-fastener.....W. J. Reed
Necktie-holder..G. A. Ferguson and A. B. Hay
Necktie-support.....N. D. Nelson
Nest and brooder, Combined trap-..... .....H. Miller and G. B. Hallenbeck
Nut-lock.....J. McIlwain
Nut-lock.....J. E. Robinson
Nut-lock.....C. H. Roff
Nut-lock.....G. D.Lawson and A. Wheeler
Nut-lock.....A. C. Woodruff
Nut-lock.....G. B. Martin
Nut-lock.....H. P. Davies
Nut-making machine, 2 pat..F. R. and C. E. Long
Oil-burner.....W. S. Jenks
Ordnance, Ammunition-hoisting apparatus for heavy.....A. T. Dawson and J. Horne
Ore matter, Means for the concentration by amalgamation of values of metallic..R. Luckenbach
Organ, Reed-.....L. A. McCord
Outlet-box.....J. T. Meleady
Package-tie.....H. J. Lee and E. F. Gray
Packing, Hydraulic.....F. Hymans
Packing-ring.....C. R. Maples
Paints, Manufacture of.....R. S. Perry
Panel-board.....A. E. Blackman
Panic-bolt.....H. G. Voight
Pantographs, Electric control for.....A. T. Ziegler
Paper-bag machine.....O. Hesser
Paper-bag-making machinery.....S. Duerden
Paper box for packing paints, &c....F. E. Cornell
Paper, Producing translucent.....H. Kuhn
Pasteboard with paper, &c., Machine for coating.. .....W. Kellner
Pasteurizing apparatus.....A. A. Pindstofte
Peeling machine, Apple-.....R. Buchi
Pen, Fountain-.....M. W. Moore
Penholder.....W. B. Grover
Pencil-holder, Pocket.....J. O. Heinley
Pencil-point sharpener.....A. W. Elsner
Pencil-sharpener.....E. H. Humphrey
Percolator.....C. A. Stelle
Percolator, Simple-syrup.....S. T. Hensel
Phenol halogen phthalein compound..... .....W. R. Orndorff
Phonogram.....F. C. Applegate
Phonograms, Making.....F. C. Applegate
Phonograph-records, Holder and index for..... ....R. E. Alexander and M. J. Knickerbocker
Phorometer.....J. E. Cogan
Piano-actions, Tool for applying bridles to..... .....A. G. Crawford
Piano-pedal connection, Adjustable.....H. Meyer
Pick.....C. H. Blow
Picker-stick attachment.....W. D. Park
Picture apparatus, Moving-.....H. Voege
Picture-exhibiting machine.....F. H. Richards
Picture machines and stereopticons, Controlling-switch for moving-.....T. Taira
Pins, &c., Machine for manufacturing grooved... .....A. L. Mowry
Pipe-coupling.....G. W. Curry
Pipe-coupling.....E. Marek
Pipe-lines, Device for passing cables through (reissue).....H. A. Greenan
Pistols, &c., Automatic safety appliance for..... .....J. Tambour
Piston.....T. Hall
Planing-machine.....W. A. Robertson
Planter, Corn-.....V. F. Pavey
Plow.....F. R. Mosher
Plow.....C. Christensen
Plow attachment.....C. W. De Kay
Plow attachment.....P. Flynn
Plow, Gang-.....L. A. Hubert
Plow-sweep.....S. H. Carpenter
Plumbing joint-fitting and attachment..... .....W. J. and P. M. Forster
Popcorn-popper.....M. H. Hoffman

Post-card, Souvenir....R. Hasbrouck
Poultry-hanger....L. F. Henig
Power-generator....C. C. Tuch
Power-tacker, Portable....M. D. Phelan
Press....S. L. Carter
Press-feeding mechanism, Automatic....L. C. Krummel
Propeller....M. R. White
Propelling device, Ship-....M. Franklin
Propelling means for vessels....T. B. Taylor
Propelling mechanism, Boat-....B. F. Jacobs
Pruning-shears....E. Arneson
Pump for automobile-tires....H. Swain
Pump for wells....W. H. Larkin
Pump, Steam-....H. L. Thompson
Punch....F. Harling
Punching holes in metal plates, Machine for....C. H. Clark
Puzzle....L. W. Pullen
Puzzle....G. B. Matthews
Puzzle postal card....N. Olinger
Rack....C. J. Hawkins
Radius-averaging instrument....W. H. Bristol
Rail-clamp, Anchor....A. W. Brand
Rail clamp, Guard-....G. L. Hall
Rail-joint, Boltless....F. Kelly
Railway-rail anchor....J. M. Scott
Railway-rail joint....A. P. Finley
Railway-spike....F. B. Kobert
Railway Switch....A. A. Schumacher
Railway switch, Street-....J. Leith
Railway-switches, Device to turn....S. Ordones and L. Katz
Railway-tie, 2 patents....L. Wylder
Railways, Electric controlling and signaling system for....H. E. McDonnell
Rake....C. M. Lehigh
Raker gage and jointer....J. C. Gehrman
Reeds, ratan, &c., Article made from....G. E. Pfennighausen
Reflectors, Skirting for....O. A. Mygatt
Refrigerating-counter....E. Carpenter
Refrigerator-car..J. M. Borrowdale and J. Strain
Refrigerator, Locker....R. F. Tilghman
Relay, Self-locking....J. F. Keely
Replenishing device....J. Chandler
Rerailer....O. B. Grant
Resistance unit....H. W. Leonard
Retorts and the like, Measuring feed device for....M. Bittrich
Reversing mechanism, Automatic...H. O. Evans
Rivet....W. P. Bartel
Roasting separation process....H. A. Wentworth
Rock-like substance....A. D. Ney
Rolling flanged bars....H. Sack
Rolling flanged bars, Universal rolls for...H. Sack
Rolling manganese steel....W. S. Potter
Rolling-mill....H. Sack
Rolling-mill, Universal, 3 patents....H. Sack
Roofing joint, Metal-....L. B. Hunter
Rotary engine....R. F. Schmidt
Sad-iron....M. J. Haber
Safe-door cam....C. Bartels
Salve and ointment, Non-odorous phenol....N. Sulsberger
Sand-reel....L. C. Sands
Sash-fastener....C. A. Hunt
Saw attachment....J. I. Matthews
Saw-handle, Adjustable and detachable....R. E. Martin
Saw-jointer....J. Bohyer
Scraper, Hog-....J. F. Lawson
Screw-jack....C. V. Fowler
Screw-threading implement....G. F. Chapman
Seal....W. Collins
Seal-lock....W. K. Blodgett
Seals on papers, Device for impressing, 2 patents..F. Gottscalk
Seaming machine, Tinner's double-....H. Poell
Section-liner....E. B. Kerst
Seeder....G. A. Knoblock
Seeding device....J. Pricer and T. J. Bartow
Separator....E. H. Frickey
Sewing-machine, Lock-stitch....F. W. Merrick
Sewing shank-eyed buttons, Machine for....J. Perley
Shade-roller and curtain-bracket, Combined....C. Wright
Shade-roller and bracket, Window-..V. T. Crawford
Shaft-coupling....L. A. Westman
Shaft-detaching device....M. P. Powell, Jr.
Sharpening lawn-mowers, skates, &c., Machine for....J. L. Kyle
Shears....A. J. Baur
Sheet-feeding apparatus....A. S. Allen
Sheet-feeding machine....B. R. Stickney
Shelf, Hanging....J. E. Lee
Ship....H. C. Davis
Ship-cleaner....H. Schwartz
Shipping-cylinder cap....C. Schraudenbach
Shock-absorbing pad....L. R. Nodine
Shock-loader....J. B. Schuman
Shoe-shank randing and cutting-in machine....C. S. Gooding and S. E. Taft
Shoe, Sporting-....D. J. Golden
Shoe-tree....A. H. Taft
Shoes, Machine for pressing and shapiug the backs of....C. S. Smith and D. H. Hadsell
Shovel and hoe, Combined....D. B. Hartwell
Shredding-machine....M. F. Williams and E. H. Frickey
Shutter fastener or bower....G. Erwin
Sign, Advertising-....A. Russell
Signal transmitting and receiving apparatus, Electrical....A. T. Dawson and G. T. Buckham
Sink, Kitchen-....W. J. Reed
Siphon, Beverage-....H. J. Schmitt
Skirt-marker....F. C. Luethy
Sleigh, Self-propelled....J. H. Hayes
Small-arm....J. Tambour
Soldering machine, Can-....C. W. Sleeper
Soles for boots and shoes, Making....O.C.Davis
Speed apparatus, Variable-....E. C. Marble
Speed-indicator....W. Schaufelberger
Spring structurc....H. Reidenbach
Stacker, Hay-....E. G. Carter
Stair-guard....J. Lalonde
Stamps, Automatic machine for attaching postage-....H. S. Brewington
Steel ingots, Treating manganese-....W. S. Potter
Steel, Manganese....W. S. Potter
Steel, Producing finished shapes from manganese..W. S. Potter
Stemmer and raisin-cleaner, Cap-...W. H. Noland
Stirrup, Climbing-....P. H. Speerstra
Stock-feeding device, Automatic..L. A. Roggensack
Stone-saw....J. Gillies
Storage battery....G. M. W. Goettling
Stove....E. W. Anthony
Stove, Oil-gas cooking-....O. E. V. Ericson
Stoves, Oven for gas or vapor burning....W. Thompson
Straining, mashing, grating, and chopping machine....E. Hubert
Street-indicating device....C. E. Greenfield
Superheater, Steam-..E. H. Foster and J. Primrose
Surgical instrument, 2 patents....J. W. Kolb
Syringe for hypodermic and intramuscular injections....R. Lombardo
Syringe, Hypodermic....W. Ball
Syringe, Hypodermic....F. D. Bell
Table safety device, Round-....A. F. Elkins
Tag-holder....O. Anderson
Tanks used in skimming sullage from crucibles into water, Cover for....W. H. Carpenter
Taper-roughing tool....B. M. W. Hanson
Target-trap....W. H. Hiestand
Telephone-exchange....C. A. Anderson and W. Hagstrom
Telephone-exchange calling device....C. A. Anderson and W. Hagstrom
Telephone-exchange system....C. L. Zahm
Telephone-line-testing system..A. N. Chenoweth
Telephone pay-station, Automatic....F. X. Bee
Telephone-transmitter....C. E. Egner and J. G. Holmstrom
Telephone-transmitter (reissue)....W. W. Dean
Theatrical apparatus....I. M. Wiengarden and A. Cummings
Therapcutic device....S. T. Yount
Thermostat....J. H. Brady
Thresher-feeder carrier....J. W. Kennedy
Threshing-machine....O. A. Amble
Tie lifter and holder, Combined....T. Warren
Timber-felling machine....E. S. Cuyler
Tire and tightening means therefor, Vehicle-....G. A. Krohn
Tire-inflating device....E. Hayne
Tire-protector anchor....S. C. Wolfe
Tire, Vehicle-....C. F. Fisk
Tobacco-pipe....J. E. Irving
Tongs....J. L. Munsill
Tool, Combination-....T. B. Huestis
Tool-holder....S. Lowe
Tool-holder....W. A. Peck
Tool-holder, Machine-....H. O. Evans
Tool, Pneumatic....H. Leineweber
Torpedo, Railway-....F. Dutcher
Toy....H. R. Graham, Jr.
Toy....A. Klink
Toy....G. Henery
Toy cannon....W. H. Cornford
Track-inspector, Automatic....T. Ellis, G. H. Purvis, and J. S. Creech
Tracker-board....F. C. White
Traction-increasing device....A. E. Kintner
Train interlocker and cross-bridge..J. Cooperstock
Train-line coupling, Automatic....J. W. Jackson
Transom-lifter....A. C. Goethel
Transom-ratchet....L. J. Berg
Transplanting implement....L. C. Doughty
Trap....C. Clark
Traverse-ring..F. L. Lathrop and H. E. Chase
Trick lung-tester....C. E. Herd
Truck, Hand-....B. Keyser and C. F. Ingold
Truck, Hand-....L. X. Truxler
Tube-mill, &c....P. T. Lindhard
Tubes, Forming metallic....L. D. Davis
Tubes, Method of and apparatus for interiorly coating....E. James
Tubing....E. T. Greenfield
Tubing, Sheet-metal....W. P. Lawrence
Tuberculosis, Preparing a preventive of....J. F. Rosenbach
Turn-table....H. M. Verplanck
Twine-cutter, Safety....F. H. Haskell
Type-writer carriage-return and line-spacing mechanism....G. Trejo
Type-writer desk or table-top....G. M. Crider
Type-writer paper-roll attachment..A. F. McCulley
Type-writing machine....J. A. Hagerstrom
Type-writer machine....L. C. Myers
Type-writer machine....E. L. Pfunder
Type-writing machine....J. Felbel
Type-writing machine....J. H. O'Brien
Umbrella, Folding....J. Edmondson
Umbrella-frame....E. C. Beecher
Umbrella-rib socket....C. Hoff
Vacuum-cleaner..T. Wiedemann and J. H. Templin
Valve....P. W. Knauf
Valve, Air-....F. C. Goff
Valve, Automatic relief-....N. Gambino
Valve, Automatically-closing....F. H. Goldsmith
Valve, Lock-....T. M. Swank
Valve, Needle-....J. Maas
Vehicle-brake....G. Stables
Vehicle running-gear, 2 patents....I. E. Palmer
Vehicle steering-gear....J. A. Wilson, Jr.
Vehicle, Trackless power-driven, 4 patents....I. E. Palmer
Vehicle-wheel....T. F. Scott
Vehicle-wheel..E. Dettelback and E. W. B. Powell
Vehicles, Means for preventing rebounds in....S. Furmidge
Vending-machine....G. F. Johnson
Vending machine, Stamp or ticket...E. D. Schmitt
Veneering-machinc....T. Richardson
Veneers, Gluing (reissue)....A. A. Dennis
Vise and sharpening-gage, Combination tool-....G. T. Cantara
Voting-machine construction....C. F. Currey
Wagon-body....H. Wachter
Wagon-brake....J. Auth and H. Kettler
Wagon, Dumping-....H. L. Hazen
Wagon-jack....R. C. Tucker
Wagon-rack, Revolving suspension..W. H. Martin
Walls, &c., Reinforcement for brick..T. A. Weaver
Washing-machine, Rotary....W. E. Perry
Watch-movement holder....G. W. Bowers
Watch-setting device....J. H. Gorman
Watch-setting mechanism....A. Plean
Watch stem-winding mechanism....A. Plean
Watchmaker's roller-replacing tool..G. W. Bowers
Water-closet floor-coupling....O. D. Wheeler
Water-closet-outlet connection....C. H. Moore
Water-heater....D. W. Allman
Water-heater, Electric....P. P. Meyers
Water-meter, Self-registering....F. W. Hanna
Water-motor....C. J. Duncan
Water-purifier....J. W. Morrison
Water, Purifying....J. W. Morrison
Water-tube boiler....G. Kingsley
Wave-motor....J. L. Matthews
Weaving....B. F. McGuiness
Weeder....G. Greene
Weevils, Machine to destroy cotton-boll....F. H. Lathrop
Weigher, Liquid-....E. F. Shue
Wheels, Detachable spur for vehicle-....E. E. Eastwood
Winding-machine....M. Pipling
Windmill power-saver....J. R. Byrnes
Window-screen....J. H. Cornelison
Wire-clamp....S. Gibson
Wire-stretcher....E. F. Hopkins
Wire-stretcher, Combination....J. T. Ferguson
Wires, Grounding device for terminal for line-....W. R. Garton
Wood, Coloring, 2 patents....W. A. Hall
Wood, Coloring and graining....W. A. Hall
Wrench....I. D. Board
Wringer-clamp....P. Helfrich
Writing instrument....J. W. Dyches

DESIGNS.

Glass pitcher....S. Hawkes
Light-shade, 2 patents....A. J. Sanford
Spoons, forks or similar articles, Handle of....J. E. Birmingham

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MECHANICAL PATENTS.

Adjustable bolt, Quickly-....N. W. Trautner
Aeroplane....S. W. Applegate
Agitator....F. E. Goldsmith
Agricultural implement....W. B. Estis
Air-brake regulator....C. J. Doerr
Air-hrake retaining-valve....J. F. Speigel
Air-compressor....F. A. Preuss
Air-ship....B. W. Dysart
Annunciator-case....H. D. Crouch
Ash-tray....S. Grunthal
Auger attachment, Post-hole-....E. Eisenbraun
Auger, Square-hole....J. Nielsen
Axle, Combined steering and driving..J. W. Buchan
Bag-closure....F. McKain
Bag-fastener, 2 patents..C.Hiering and A. Fuller
Bag-fastener....N. L. Ranum
Bag-frame catch....C. Hiering and A. Fuller
Bale-straightening and cleaning machine, Cotton-....F. M. Morton and W. H. Dismuke
Baling-press....F. A. Bothwell
Ball-grinding machine....C. A. Hirth
Balloon....R. C. Tilghman
Ballot-box....W. W. Wills
Band-brake....J. N. Lawrence
Banking-machine....A. Clark
Bath-tub attachment....A. Bulin
Bearing, Ball-....W. E. Cane
Bearing, Center-....H. S. Rader
Bearing, Thrust-....A. T. Killian
Bed-covering....W. H. Bender
Bed, Folding....C. R. Gardner
Bed, Wall or cabinet....N. B. Douglass
Beet-blocker....E. Kraak
Belting....H. Loeb
Benzoate, Manufacturing, 3 pat..E. O. Barstow
Block-signaling apparatus....S. A. Wood
Bluing device..A. L. Willcocks and A. P. Thorley
Boat....W. T. Urie
Bobbin-case....L. E. Weaver
Boiler-bracket....W. Withem
Boiler-compound mixer and feeder....T. E. Palmer and W. W. Baker
Boiler superheater, Locomotive-...L. E. Feightner
Bolt-case....R. W. Hubbard
Boot and shoe polishing machine..H. C. Lowenstein
Boot or shoe upper....D. Sack
Bottle, Antirefillable....J. N. Landon
Bottle, Non-refillable....E. Ferguson
Bottle, Non-refillable....L. M. Packard
Bottle, Non-refillable....S. Peloso
Bottle, Non-refillable....S. A. Miner
Bottling-machine....J. H. Champ
Bowling-alley amusement device....H. Leighton
Bowling-alley finishing and leveling machine....O. L. Pickard
Box....H. L. Miner
Box....E. Langschmidt
Box-filling machine....J. C. Thom
Box or case....F. J. Kress
Braiding-machine....A. E. Chernack
Braiding-machine..B. F. Parks and S. W. Wardwell
Brush-guard....A. D. Lockwood
Buckle....A. Cohen
Built-up article....W. C. Harlow
Burette, Automatic....S. D. Beard
Button, Cuff-....L. A. Gardner
Button, Link cuff-....E. W. Morehouse
Cabinet and display-rack, Combined..A. E. Baker
Cake-coating machine....P. D. Harton
Calks, Making steel-center....J. R. Williams
Can-bottoms, Machine for applying..J. C. Thom
Cans, Heading sheet-metal....B. Adriance
Canning apparatus....T. H. Eidson
Car angle-cock holder, Railway-....L. A. Hoerr
Car-brake....J. W. Johnson
Car-coupling....W. S. Lennon
Car-door....F. X. Malocsay
Car door, Grain-..H. J. Bickle and M. McMillan
Car-door-operating mechanism, 2 patents....C. A. Lindstrom
Car-door-operating mechanism, Dump-...S. Otis
Car, Dump-....C. H. Clark
Car end-gate, Mine-....L. F. Brubaker
Car-fender....M. L. Keizur
Car-fender, 2 patents....J. O'Leary
Car, Motor hand-..W. S. Hovey and M. H. Rix
Car-mover....R. F. Hageman
Car, Pay-within passenger railway-..A. H. Englund
Car-seat, Folding..J. S. Farrell and J. S. Lewis
Car-ventilator....C. M. Askegren
Car, Weed-burning....G. L. O'Neale
Cars, Lumber-roller for....E. L. Stocking
Cars, Radiator suspension for motor-..G. Enrico
Carboy....A. J. Miller
Carboy-protector....F. B. Lothrop
Carbureter....E. A. Dickson
Carbureter....R. Papanti
Carbureters, Reed air-intake regulator for....F. C. Reineking
Card-case or pocket-book....M. W. Cummings and J. F. Jordan
Carding-machine alarm....E. P. Schmitt
Carpet fastener, Stair-....C. W. Kirsch
Carpet-fasteners, Tool for detaching..W. H. Boles
Carpet-sweeper brushes, Device for cleaning....F. W. Myers
Carrying and pressing apparatus..C.S.Wheelwright
Cartridge, Blasting-...G. Wolsey and L. Fussey
Cash-register....W. H. Muzzy
Catamenial garment....A. L. Brodton
Cement-block machine..F. J. Emal and C. P. Horn
Cement-kiln....T. A. Edison
Cement, Manufacture of....S. O. Cowper-Coles
Centrifugal machine....G. N. Goddard
Chain-manipulating tool....J. C. Jensen
Chair attachment....A. V. and W. H. Jackson
Chair detachable book-rest....T. E. Vickers and A. L. Henry
Chair extension-arm..F. E. Payne and M. M. House
Chairs, Adjustable foot-rest for Morris....C. L. Greilick
Chalice....G. Valley
Chuck....W. B. Pearson and E. R. Seward
Churn and ice-cream freezer, Combined....W. A. Jones
Chute, Bean-....R. A. and H. O. Haenke
Chute, Waste, 2 patents....G. A. Hofmeyer
Circuit breaker, Automatic electric-....W. F. Meter and W. L. Rideout
Clay-gathering machine....C. E. Olden
Cleaner....J. Hadka
Clothes-drier....G. B. Deacon
Clothes-line reel....S. S. Rider
Clothes-line support....G. A. Culbertson
Clutch, Driving and brake....F. T. Gottschalk
Clutch, Pulley-....A. H. Cameron
Coin-operated machine....W. W. Rosenfield
Collar....E. L. Bevington
Collar machine, Horse-....J. C. Collett and A. C. Jackso
Collar supporter....B. C. Bubar
Compass, Beam-....F. S. Hurst
Compasses, Apparatus for recording-....E. Schuette and N. Dedrick
Compasses, Chart for recording-....E. Schuette
Composition of matter....C. F. Ackerman
Computing-machine, 2 patents....J. M. Daly
Concrete beams, girders, and arch-ribs, Construct ing and erecting reinforced-....F. W. Skinner
Concrete-block machine....O. H. Davis
Concrete-block machine....C. E. Phillips
Concrete conveying and mixing cart..F.H.Lathrop
Concrete-mixer....M. H. Reed
Concrete-mixers, Power for charging device for..A. E. Smith
Concrete, Reinforced....F. Thun
Concrete-reinforcing bar....J. M. Dudley
Concrete-reinforcing, Holder for....J. W. Reed
Concrete-tile mold, Portable....F. M. Wiltrout
Conveyer-bucket....J. B. Gibson
Coop, Poultry-....C. I. Bumpass
Copper or copper-nickel mattes, Treatment of....J. T. Carrick
Cornet....Z. A. Meredith
Corset....A. M. C. and M. M. J. Serruys
Corset....J. A. Daley
Cotton-chopper....I. F. Harris
Cotton-chopper....S. L. Martin
Cotton-separator....W. A. Patterson
Craft adapted to travel in a resisting medium....C. M. Stanley
Crate |Folding....J. I. Hall
Crate, Folding....F. C. Edson
Crate, Shipping-....H. N. Backus
Credit ststem....J. O. Greenwald
Crown-matrices, Machine for contouring....F. O. Jaques, Jr.
Cuff....E. L. Bevington
Cuff-holder....W. S. Bachman
Cultivator....S. Waltman
Curtain-bracket....C. B. Dumond
Cushion-stuffing device....C. A. Lee
Cutting, beating and pulverizing machine....C. M. Lauritzen
Cutting-tool....A. E. Waller
Dental inlay-holder....B. F. Copp
Dental tooth-clamp....G. A. Harper
Detonator....C. A. Woodbury
Die....F. H. Hotchkiss
Die-stock....F. E. and F. W. Wells
Dies, Forming....E. D. Boyce
Disk drill....S. E. Davis
Display-bin....A. H. Plumer
Display-box....A. and J. Eichhorn
Display box and tray....E. M. Lewis
Display device, Heat-operated....J. R. Keller
Display-holder....J. Brauchli
Distilling alcohols and other volatile liquids....A. G. Waterhouse
Ditch-digging machine....E. Jeschke
Door-fastener....J. Auger
Door-lock, Combination....A. E. Brown and J. M. Roberts
Doubletree, Four-horse....M. McEvoy
Dough-mixing machine....C. Chambers, Jr.
Draft appliance....O. Atkinson
Dredge....C. W. Diehl
Dress-shield....R. S. Kleinert
Drilling-machine....J. W. Green
Drinking fountain for birds, fowls, and animals...W. B. Gething
Drinking glasses, bowls, cups, spoons, &c., Labial protecting means for....L. Jancey
Drinking-vessel, Sealed....J. C. Schleicher
Drip-receiver....H. O. Bessette
Drum batch-mixer....W. R. Tuttle
Eaves-trough....G. Hensler
Educational device....A. S. Kilroy
Egg-box, Folding....C. T. Bloomer
Egg-tester....J. W. Billings
Electric-conductor coupling, 2 pats..J. L. Hinds
Electric discharges, Apparatus for producing....H. Lauling
Electric machine for ignition purposes, Magneto-....A. Vandervell and F. I. Hoffman
Electric motor, Alternating-current..J. T. Schaaff
Electric switch....F. Hoerle
Electric switch....J. H. Rusby
Electric trasmission of messages....G. Sellers
Electric currents, Apparatus for strengthening weak....A. Pollak
Electrical transmission of graphic messages....G. Sellers
Elevator feed-wheel, Liquid-....J. F. Barker
Embroidering-machine....J. Brunnschweiler
Engine ignition device, Explosive-...A. F. Clarke
Engines, Combustion device for doing away with exhaust-gases in combustion-..K. and E. Lehmann
Envelop....L. R. Swett
Envelop, Safety-....R. Hasel
Excavating-machine, 2 patents....D. W. Miller
Expansion-bolt..C. D. Vernon and J.P.Morningstar
Explosive-engine....A. J. Cole
Eyeglass-guard....C. L. Merry
Eyeglasses....S. J. Clulee
Fabrics, Machinery for manufacturing textile....W. Bowker
Fan....L. L. Korach
Fan, Electric-motor....N. A. Locke
Fare-recorder....F. Batt
Fastener-setting machine....W. E. Bennett
Faucet and hose-coupling....H. P Towle
Faucet hose-coupling....H. P. Towle
Feed-box....A. D. Myers

Feed-water injectors, Attachment for..C. Phillips
Feed-water regulator.....C. Brent
Fence-clamp.....A. C. Harrison
Ferrule, Waste-.....J. Klein
Fiber-cleaning apparatus.....J. K. Toles
Fifth-wheel.....J. Herby
Film-drying machine.....F. B. Thompson
Filter.....A. G. Sheak
Filter.....J. W. Hammett
Filter, Water-....I. K. Hisey and R. M. Wardle
Finger-ring.....L. E. Sadler
Fire-alarm test apparatus.....J. G. Nolen
Fire-escape.....J. E. Andrews
Fire-pail, Air-tight.....C. F. Crane
Fire-protection signal system.....
.....J. G. Nolen and J. E. Shepherd
Firearm, Automatic.....W. J. Whiting
Firearm-sight.....W. J. C. Downey
Flash-light apparatus.....J. W. Underwood
Float-coupling.....C. Dargent
Flue, Metallic.....L. D. Armstrong
Fluid-pressure regulator.....F. H. Brown
Flushing-tank.....C. C. Lindley
Fly-screen.....E. Curtiss
Folding seat.....W. G. Winans
Folding table.....C. E. Forbes and A. Singer
Forging-press.....C. Mercader
Frangible receptacle-..J. L. Watson, Sr. and Jr.
Fruit-cooling apparatus.....M. W. Groom
Fruit cutter and squeezer.....D. H. Mosteller
Fruit-packing device.....F. B. Pease
Furnace.....W. B. Merkel
Furnace.....U. Wedge
Furnace-charging apparatus, Blast-.....
.....W. and A. Crooke
Furring-strip.....F. E. Sagendorph
Fuses of projectiles, Safety device for the.....
.....E. Schneider
Game apparatus.....L. T. Young
Game-element carrier, Coin-controlled.....
.....R. F. Pendleton
Garment.....P. B. Sherman
Garment-holder.....C. C. Livingston
Garment-presser.....C. A. Friedrich
Gas-burner.....B. A. Geurink
Gas-burner, Self-closing.....C. A. Johnson
Gas generator, Acetylene-.....F. J. Moss
Gas-manufacturing apparatus.....B. Loomis
Gas or oil burner.....O. J. Heindel
Gas-producer.....G. L. Morton
Gas-regulator.....M. Graetz
Gasolene apparatus, Storage.....H. E. Grant
Gasolene-supply, Strainer and separator for.....
.....G. M. Schebler
Gate.....F. B. Tice
Gear, Transmission-.....W. S. Hovey
Gear, Variable-speed-transmission...E. P. Cowles
Gears, Draw-bar and yoke attachment for draft-..
.....C. L. Bundy and J. J. Acker
Gearing for stentering-machines....A. E. Simpson
Gearing, Frictional.....L. C. Arnaud
Generator and mixer.....E. R. Wilson
Glass-cutting tool.....J. Lamb
Glazier's point.....C. A. Buffat
Governor.....N. C. Bassett
Governor for internal-combustion engines.....
.....W. M. Power
Grain-separator.....W. P. Silver
Graphophone-horn and record-case, Combined...
.....W. Smith
Grass-cutting device.....W. S. Hayden
Grate.....C. F. Butler
Gun-carriage for field ordnance.....J. A. Deport
Gun-stock.....L. F. Kennedy
Hair-tonic.....F. W. E. Muller
Hame and trace connection.....F. F. Hodges
Hame-fastener.....G. W. Reyer
Hammer, Pneumatic.....H. H. Grobes
Handle.....G. A. Schehr
Hat-carrier.....G. H. Wheary
Hat-holder.....W. T. Truitt
Hat-protector.....W. J. Stewart
Hatchet.....W. S. Ward
Hay-sling.....J. M. Boyd
Head-rest.....J., A., and J. P. Barker
Headlight, Locomotive-.....
.....J. A. Hamby and S. S. Butcher
Heat, Composition of matter for the generation of
.....F. J. Tone
Heat-generating composition.....F. J. Tone
Heater.....A. L. Schellhammer
Heel-building machine.....W. Paris
Heel-compressing machine.....G. B. Grover
Hinge-joint for lockets, &c.....E. Morris
Hinge structure, Gate-.....
.....G. I. Kendrick and J. Carroll
Hog-trap.....J. Dobry
Hoisting apparatus.....H. W. Bachelder
Hoisting or conveying apparatus.....A. E. Norris
Hoisting or logging device.....W. H. Corbett
Horse-blanket.....E. S. Burwell
Horse-detacher.....W. J. S. Ritscher
Horseshoe.....I. C. Patsch
Horseshoe..G. W. Cogswell and W. H. MacCrone
Horseshoe-bending machine.....D. Freuler
Hose-coupling, 4 patents.....V. P. McVoy
Hose-coupling, Air-.....E. L. Brown
Hosiery-turner.....F. Pope
Humidifier.....M. Tillotson
Ice-cream can.....L. H. Scheck
Indicator.....W. Houghton
Inseam-trimming machine.....
.....F. H. Hawkins and A. Bourgeois
Insulating shaft-coupling.....J. R. Grundy
Internal-combustion engine.....W. M. Appleton
Internal-combustion engine.....A. J. West
Iron-oxid scale, Electrolytically removing, 2 pats.
.....C. W. Danforth and N. Jones
Key-fastener.....W. A. Loveland
Kinetoscope.....A. C. Roebuck
Kinetoscopic apparatus.....J. E. Lagergren
Kitchen utensil.....F. H. Hamblin
Kitchen utensil.....J. Saul
Knife-blade, Detachable.....M. H. Sterling
Knitting machines, Lace-pattern mechanism for
straight-.....B. Salzer and G. Walther
Lacing-tips and the like and composition for the
same, Fabric for.....G. W. Prentice
Lamp, Carriage-.....H. Blau
Lamp, Gas or vapor electric.....P.C.Hewitt
Lamp, Mercury and other vapor electric.....
.....H. A. Kent and H. G. Lacell
Lamp, Miner's electric.....H. Remane
Lantern.....J. H. Pence
Lantern and heater, Combination..O.H.Armington
Last, Locking collapsible.....C. F. Pym
Last, Shoe-.....A. J. Buch
Lathe tool-post.....C. L. Libby
Lawn-rake, Rotary.....C. Walte
Lead-joint runner.....W. Vanderman
Lens carrier, Lantern-.....F. D. Spear
Lens-grinding machine, Automatic prescription-..
.....E. O. Mattern
Leveler, Automatic.....E. Woodward
Lever.....J. R. Weatherly
Lifting-jack.....F. M. Allerton
Lighting and extinguishing device, Automatic....
.....A. J. Bedford
Line-casting machine.....J. McNamara
Line-casting machines, Keyboard mechanism for
.....J. R. Rogers
Lino-slug-trimming machine.....S. R. Carter
Linotype-machine.....F. Johannesen
Liquid as a motive power, Method and means of
utilizing.....E. Taylor
Liquid cooling and dispensing apparatus.....
.....G. W. and W. H. Fulper
Liquid-dropper.....E. K. Scott
Liquid-fuel burner.....B. Moore
Liquid-fuel-lighting system.....A. Burton
Lock-bolt.....L. and D. Moeller
Lock-key.....I. C. Freud
Locks, Seal attachment for.....C. H. Johnson
Loom filling-detector mechanism..G. F. Hutchins
Loom filling-detector mechanism, Weft-replenish-
ing.....E. H. Ryon
Loom pattern-mechanism.....
.....H. A. Owen and A. K. Pratt
Loom picker-stick mechanism.....L. P. Sherman
Loom-shuttle.....J. V. Cunniff and C. Rafferty
Loom, Weft-replenishing.....E. H. Ryon
Looms, Filling-thread-cutting device for weft-
replenishing.....B. F. McGuiness
Looms for weaving, Beating-up mechanism of....
....W. Hollas, R. Farnworth, and T. Jackson
Loss-preventing device.....M. T. Fish
Lubricant.....J. W. Watkins
Lubricating device.....F. R. Paine
Magneto-generator.....R. H. Hassler
Mail-bag deliverer.....S. B. Colbert
Mail catcher and deliverer, Railway..W. T. Sebree
Mail delivering and receiving device..J. A. Bossie
Mail-delivering apparatus.....J. T. Howard
Mail-delivering appliance for railway-trains.....
.....H. J. Hill
Mail-pouch catching and delivering apparatus...
.....J. A. Olbon
Manhole-closure.....C. C. Puffer
Massage and air-compressing machine..J. B. Fey
Match-box, Automatic.....J. G. Hanna
Match holder or safe.....H. M. King
Match machine.....W. R. Swett
Match-safe, Pocket.....J. F. Beatty
Matrices, Dovetail-notch-chamfering machine for
.....H. A. Reynolds
Matrix-channeling machine.....H. A. Reynolds
Matrix combination punching-machine.....
.....H. A. Reynolds
Measurer, Liquid-.....C. C. Allen
Metal box (reissue)....G. Klenk and J. F. Fink
Metal-shears.....G. Potstada
Metallic tie.....T. B. Bradford
Micrometer.....H. Spahn
Milk, Desiccating.....F. X. Govers
Milk-heater.....H. C. Root
Miter-gage.....J. Erikson and G. R. Wikander
Mold.....J. N. Erixon
Molding-flask.....J. D. Millar
Molding mechanism.....W. Zimmerman
Mop.....G. B. Wichmann and D. Rich
Mower trimming attachment, Lawn-....H. Smith
Music-turner.....W. and R. Mark
Musical-instrument strings, Holder and protector
for.....O. J. Muller
Musical-instrument tracker mechanism.....
.....T. P. Brown
Net frame, Landing-.....G. M. Barnes
Nut-lock.....W. Atkins
Oil and grease gun, Combined.....F. J. Ball
Oil-burner.....C. Eckland
Oil-cake-forming machine.....A. W. French
Oiling device for gas-meter diaphragms, Auto-
matic.....J. R. Daly
Ore-separator, Magnetic.....W. D. Ludwick
Oven, Bake-.....B. A. Geurink
Packaging-machine.....B. W. Tucker
Packing and display receptacle.....W. E. Collins
Painting machine, Wheel-.....J. Heinz
Paper-box-blank machine....J. R. Van Wormer
Paper cutter and printer, Automatic roll-.....
.....G. V. A. Pine
Paper-dish-making machine.....I. Bertin
Paper-feeder, Automatic.....J. Hren
Paper shells, Machine for making.....J. Chesney
Pedal and panel mechanism.....T. P. Brown
Pen, Fountain-.....H. J. Upton
Pen-holder.....R. J. Cox
Pendant.....A. Jacques
Percolator.....J. B. Livingston
Perforator, Casing-.C.E.Lapp and W. H. Harrison
Permutation-lock.....O. Anderson
Phonograph.....F. E. Holman
Piano-violin.....J. Bajde
Pianos, Repeating-action for grand.....
....F. A. Wessell, H. A. Nickel, and A.L.Wessell
Pianos, Sostenuto attachment for.....E. Peterson
Picture-hanger, Adjustable.....J. Degan
Picture-machines and phonographs, Synchronizing
device for.....P. Seiler
Pipe and cleaner therefor.....M. A. Hadcock
Pipe-cleaning apparatus.....G. A. Lutz
Pipe-coupling.....F. C. Pahlow
Pipe-joint, Flexible.....W. A. Greenlaw
Planter and harrow, Combined.....J. M. Tucker
Planter, Corn-.....C. W. Lanham
Planter, Corn-.....L. E. McQuitty
Plow.....H. H. Julich
Plow, Reversible.....W. Koehler
Plow, Reversible.....J. J. Nall
Plowing-machine..D. F. Kuster and G. J. Niemann
Pneumatic-despatch system.....P. R. Shill
Pot and kettle cover.....I. Chapman
Powder-cutting machine.....C. Dobbs
Powder distributer, Enameling-.....W. Lindsay
Press.....L. H. Conner
Press.....H. G. Miller
Press-button.....R. Scheewe
Pressure control, Automatic.....J. H. Smith
Pressure generating and applying device, Hy-
draulic.....J. W. Nelson
Pressure Generating Controlling and Applying
Apparatus, Hydraulic .....J. W. Wilson
Printer's galley.....A. S. Orchard
Printing and issuing machine, Ticket...R. North
Printing and issuing tickets and registering fares,
Machine for.....R. North
Printing-machines, Sheet-inverting apparatus for
use in connection with.....T. R. G. Parker
Printing-plate.....C. Owens
Printing press, Multiple-.....A. Scheuerer, Jr.
Projectiles.....H. M. Gleason
Pulverizer, 10 patents.....M. J. Williams
Pump.....A. Heimann and L. Flatow
Pump, Air-lift.....F. G. Kimball
Pump, blower, and the like, Centrifugal and similar
.....W. Scheurmann
Pump-bracket.....L. A. Washburne
Pump or apparatus for raising water by means of
compressed air, Pneumatic.....T. O. Perry
Punch, Metal-.....W. C. Robinson
Punching-machine, Rotary.....F. Koelsch
Purse or bag frame.....C. Hiering and A. Fuller
Puzzle.....A. Schesnack
Puzzle, Base-ball.....T. Mooney
Quadrant adjustment, Split-switch..J. L. Soutar
Quebracho extract, Treatment of.....
.....A. Redlich and J. Wladika
Quoin.....M. Muchler
Race-strap.....L. B. Garrison
Rail.....N. Rendleman
Rail-fastening.....J. Hitzert
Rail-joint.....E. J. Frost
Rail-support.....G. M. Cote
Rail-tie.....A. J. Chambliss
Rails, Manufacturing.....N. Rendleman
Railway crossings, Groove-filling device for street-
.....P. K. Young
Railway-joint.....H. T. Fiske
Railway-rail joint.....W. Wallace
Railway-rail joint.....R. S. Du Bose
Railway safety device.....O. J. Berend
Railway-switch mechanism.....B. Legault
Railway-tie, Metallic.....J. G. Snyder
Railway-track construction.....S. J. Scott
Railway-track-rail holder and brace.....J. T. West
Railway-track-tamping machine...W. C. Maxwell
Railway-traffic-controlling system.....H. Bezer
Ratchet and drill extension.....H. J. Forster
Razor-blade strop.....I. Conrad
Razor, Safety-.....W. Diebel
Razor, Safety-.....H. Wilcox
Reamers, Arbor for shell-.....R. H. Stearns
Receptacle-closure-removing device.H. E. Shepard
Refrigerator.....E. F. Cramer
Refrigerator-car.....H. Pries
Refrigerator drip-pans, Automatic alarm for.....
.....J. F. Phillips
Registering apparatus.....R. North
Reinforcing-bar.....T. W. Jenks
Relay, Electromagnetic.....D. I. Garretson
Resawing-machine.....H. J. Gilbert
Resilient wheel.....J. Rountree
Rivet-spinning machine, 2 patents....W. P. Seng
Roasting and like furnace.....U. Wedge
Roasting-furnace.....U. Wedge
Roasting-furnace.....A. R. Wilfley
Roll-shaping apparatus.....W. U. Dennison
Roller.....A. E. Blight
Roller, Road-....M. J. Todd and D. Farquhar
Rolling structural material, Regulating initial
strains in.....A. H. Emery
Rope-making machine.....H. Personett
Rope portieres, Laying-table for.....W. T. Smith
Rosin, Bleaching.....L. C. Minor
Rotary carrier.....F. A. Johnson
Rotary engine.....J. A. Mack
Rotary engine.....J. Marks
Rotary engine.....G. Schulz
Rotary engine.....J. A. Quill
Rubber soles to boots and shoes, Apparatus for ap-
plying.....E. A. Saunders
Sack-holder.....J. E. Hull
Safe, Wall-.....W. H. Reynolds
Sage-brush and weed cutter.....
.....H. E. Gale and E. E. Krengel
Sand-mold flask.....J. D. Millar
Sash-bar construction for sky-lights in greenhouses
.....J. F. M. Farquhar
Sash-holder.....J. N. Hilton
Sash holder and lock.....T. Kephart
Sash-lock.....J. C. Deggim
Sash-lock.....H. Neble
Sash, Metal.....H. H. Forsyth
Sawing-machine.....A. Fisher
Sawing-machine.....F. N. Trevor
Sawmill-carriage-operating mechanism..C. A. Jones
Scaffolding (2 reissues).....G. E. Humphries
Scale.....F. H. Buckingham
Scale.....S. C. Cooper
Scale.....J. L. Pipe
Scale.....W. F. Stimpson
Scales, Friction and inertia counteracting device
for.....E. H. Strauss
Scorer, Pork or like.....H. Matthews
Scraper.....F. J. Dumond and D. W. Hall
Scraper, Road-, 2 patents.....C. H. Casner
Screw-machine, Automatic.....H. B. Lester
Sealing apparatus.....J. C. Thom
Search-lights and the like, Remote electric-control
system for.....A. Le Blanc
Seat-frame.....E. G. Budd and J. A. Wolle
Seeder, Sugar-beet.....G. M. Roos
Semiplastic substances, Instrument for handling..
.....J. Holtzmann
Sewer-traps, Testing-plug for.....J. F. Christy
Sewing-machine embroidering attachment.....
.....D. C. Lee
Sewing-machine, Overseaming.....E. Prazak
Sewing-machine work-holder.....A. H. De Vee
Shade and lace-curtain support, Window-.....
.....H. F. Cook
Shaft-coupling.....F. B. Richardson
Shaft support, Buggy-.....J. D. McCabe
Sharpener, Disk-.....F. H. Klenke
Sharpener, Dental-instrument.....C. Wiethoff
Sharpener, Lawn-mower-cutter.....V. Willimack
Sharpening and honing device, Razor..T. Doswald
Sharpening device, Blade-.....W. D. Chapin
Sheet-metal bodies, Forming.....I. N. Jones
Sheets, Guide mechanism for traveling.....
.....L. B. Doman
Shipping-package.....F. F. East
Shock-loader.....J. B. Schuman
Shoe, Sewed.....G. L. Pierce
Shutters and elevators, &c., Electrical controlling
system for rolling or sliding.....L. G. Wilson
Sign apparatus, Repeating mechanical.....
.....F. A. Rudolph
Sign, Rotatable.....D. I. Whiteside
Silo.....F. J. Van Cott
Silo.....C. Cminer
Silver, Assaying for.....J. C. Hames
Sinks, Adjustable support for.....F. J. Raehn
Skate brake, Roller-.....S. J. Nesbitt, Sr.
Skate, Roller-.....T. Spacie
Sled.....J. Z. Ducharme
Sleigh attachment.....S. L. Charles
Slicing machine, Meat-.....I. Heller
Snap-hook.....T. T. Morrow
Snap-hook.....M. Maki
Snap-switch, Two-[illegible].....L. K[illegible]
Snow from streets and sidewalks, Ma[illegible]
ing.....[illegible]
Snow-guard for roofs.....[illegible]
Soap-making apparatus.....W. A[illegible]
Solder for aluminum.....[illegible]
Sole-leveling machine.....
.....C. L. Parker and W. C. [illegible]
Sole-pressing machine.....L. L. W[illegible]
Sound-locating device.....[illegible]
Spark-arrester.....E. L. R[illegible]
Speed device, Variable-.....W. F. M[illegible]
Speed indicating or recording device.W. H. br[illegible]
Speed transmission mechanism, Chara[illegible]
.....A. L. [illegible]
Spice-box.....E. Fra[illegible]
Spoon, Souvenir locket-.....I. He[illegible]
Spring-wheel.....H. H. T[illegible]
Stacker, Hay-.....A. B. and M. A. Cl[illegible]
Stalk-cutter.....J. R. Weatherly
Stamp-affixer.....E. W. N[illegible]
Stamp, Hand-.....A. D. Jo[illegible]
Stamp-mortar.....M. P. Bo[illegible]
Starting and separating gate.....R. V. Jones
Steam-generator.....F. N. T[illegible]
Steam-trap.....H. D. Singer and H. V. Fr[illegible]
Steam-trap.....N. En[illegible]
Steering-gear.....R. S. Ri[illegible]
Stirrup, Safety-.....J. L. Ja[illegible]
Stoker for furnaces, Mechanical....F. W. Seyfarth
Stone-cutting machine.....W. F. Meyers
Stone-fluting machine.....G. N. Williams, Jr.
Store-service credit-system apparatus.....
.....C. F. Kettering
Stove.....L. Moore
Stove.....J. E. Choltus and H Jeannesson
Superheater for use in connection with vulcanizers
and other apparatus.....J. Berliner
Surfacing-machine.....A. H. Whatley
Surfacing-machine.....F. R. Allen
Suspender-check.....F. B. Hawes
Suspenders.....G. M. Edgarton
Suspending device, Portable.....C. F. Redman
Sweeping compound.....
.....F. D. Wolfgram and E. Klausman
Syringe or the like.....C. P. Leyner
Syringe, Vaginal.....E. H. Keske
Table lock, Extension-.....J. A. Barbrake
Talking-machine.....W. W. Wooster
Tape.....T. P. Himes
Telegraph sending-machine.....J. A. Hulit
Telegraph system and apparatus.....T. B. Dixon
Telegraph-transmitter.....B. F. Bellows
Telegraph-transmitter.....G. M. Goddard
Telemeter.....H. Wild
Telemeter-rod.....C. E. Flanagan
Telephone attachment.....H. R. Palmer
Telephone system.....F. E. Summers
Temperature-regulating apparatus..J. M. Pullen
Thermostat.....H. G. Geissinger
Thread-cop.....A. N. Chartier
Thread-cutting mechanism, Filling-..E. H. Ryon
Thread-cutting tool.....W. Murchey
Tie-holder.....A. A. Felix
Time-lock.....E. M. Banham
Tire antislipping attachment....M. J. Frambach
Tire, Cushion-.....W. E. Maringo
Tire-fastener.....L. M. Nelson
Tire for vehicle-wheels, Elastic.....D. M. de Sa
Tire, Pneumatic.....J. L. Maitland
Tire-protector.....F. R. and C. R. Colvin
Tire, Resilient.....W. H. Rowling
Tire, Vehicle-wheel, 2 patents.....T. Midgley
Tongue, Draft-.....T. Pojar
Tonnage-equating machine.....J. M. Daly
Tool.....F. H. Gruer
Tool, Pneumatic.....C. Christiansen
Toy.....J. B. Bowman
Track-sanding device.....E. L. Larson
Track-supporting device, Overhead-.....
.....A. H. Neller and W. Louden
Traction device.....M. E. Schmidt
Train-switch, Electrically-actuated...J. Y. Porter
Tramways, Point-operating mechanism for.....
.....T. N. Atkinson
Transmission mechanism, Temperature-controlled
.....H. H. Taylor
Trap.....P. Elfstrom
Tripod.....J. M. Pullen
Trolley-head.....T. R. Stam
Trolley-head.....J. J. Bennett
Trousers-stretcher.....E. N. Hallett
Truck.....J. F. Fierke
Truck-bolster.....J. J. Byers
Truck, Car-.....C. S. Shallenberger
Truck, Hand-.....A. B. Kerndl
Truck, Lifting-.....A. A. Ake
Trucks, Blocking device for.....
.....P. E. Lattner and S. N. Robinson
Trunk, Wardrobe.....G. H. Wheary
Tube-mill lining.....G. H. Rotherham
Tube-welding apparatus.....
.....H. Dicke and E. Klinkmann
Tubing, Apparatus for making spiral.....
.....E. T. Greenfield
Turbine.....C. A. Kaiser
Turbine.....J. H. Felthousen
Turbine, Internal-combustion gas-.....G. E. Dod
Twine-making machine.....C. Kieren
Twine take-up.....J. B. Eastman
Type-writer attachment.....A. C. Kendrick
Type-writer-carriage stop mechanism.....
.....M. B. Sargent
Type-writing machine.....C. B. Yaw
Type-writing machine.....E. E. Barney
Type-writing machine.....A. T. Brown
Umbrella, Folding.....N. J. Zoller
Valve.....T. J. Hendricks
Valve.....J. L. Fitts
Valve, Air-.....J. W. Ledeux
Valve device for corrosive liquids....W. H. Smith
Valve, Regulating.....B. Blumel
Vault-closure.....A. M. Myers and W. A. Poister
Vegetable-cutter..W. S. Myers and C. C. Kahne
Vehicle-body.....E. W. Crosby
Vehicle-wheel.....L. Garnier
Vehicle-wheel.....T. Hubscher
Vehicle-wheel, Spring.....E. Murray
Vehicles, Fore-carriage of.....J. Schmitt
Vending-machine, Coin-controlled..E.F. Spaulding
Violin.....F. O. Fish
Vise, Quick-acting woodworking-..W. V. Mentzer
Voltaic high-current arcs, Production of.....
.....H. Pauling
Voting-machine, 2 pats. G. Stacy and G. A. Julius
Voting-machine counter construction..C. F. Currey
Vulcanizer.....F. E. Smith
Wagon-bed.....C. B. Tillery
Wagon, Dumping-.....J. Heberling
Wagon, Dumping-.....T. Wright

Wall and constructing same, Composite.....J. H. Magdiel
Warp stop-motion, Electric.....J. Regan
Washing-machine.....W. C. and L. R. Simmons
Washing-machine gearing.....A. Van Wormer
Water-closet-disinfecting devices, Valve for.....J. Kneen
Water-gage.....H. H. Vaage
Water-heater, Electric.....H. G. Levy and G. N. Blanchard
Water-motor.....J. Hubmann
Web-coating machine.....W. A. Daniels
Weighing-machine.....W. W. Rosenfield
Wet-machine.....W. White
Wheels, Manufacturing metal.....G. Kowarsky
Whip-socket.....R. Habekost
Winding mechanism, Self-.....A. D. Blodgett and F. S. Atkinson
Windmill-tower.....W. Hopper
Window-operating mechanism, Swinging-.....J. S. Gourlay
Window-screen.....H. B. Wilson
Wire-reel and mounting therefor...F. P. Murphey
Wire-splicer.....I. G. Huston
Wire-stretcher.....J. F. Ball
Wood-blight composition.....J. W. Lafer
Woven fabric.....T. P. Dornan
Wrench.....E. C. and G. W. Rea
Wrench.....D. Mallory
Wrench.....P. Bartok
Wrench.....L. G. Van Ormer
Yarn-cleaner or slub-catcher.....G. W. Foster

DESIGNS.

Button, Cuff-.....J. Pejchar
Doily.....R. Gair
Flag.....C. Y. Turner
Gas-burner, Vertical inverted incandescent.A.Bray
Lamp-shade.....J. Kappler
Light-shade.....A. J. Sanford
Phonograph-cabinet.....P. Weber
Purse and belt therefor.....J. Lambert
Spoon or fork.....G. L. Turner
Spoons, forks, or similar articles, Handle for.....A. A. Southwick
Toy figure.....O. Lingohr

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MECHANICAL PATENTS.

Acetates, Making.....H. O. Chute
Acetylene-generating apparatus.....A. Davis
Acetylene-generator.....J. Zanler
Acid from nickel-chlorid solution, Recovering hydrochloric.....H. L. Wells
Acid phosphate and the like, Apparatus for handling.....J. T. Capers
Advertisement-displaying apparatus....J.T.Roffy
Advertising-card.....W. O. Holt
Air-brake system.....J. W. Hicks
Air-ships and the like, Optical instrument for determining the direction of travel of...O. Krell
Alfalfa drier and mill.....W. E. Rickey
Ambulance.....J. P. L. Wilson
Annealing and hardening furnace..W. S. Rockwell
Arch-supporter, Adjustable.....T. Hughes
Asbestos covering, Sectional.....W. J. Moeller
Ash-pan.....R. B. Patterson, Sr.
Auger-bit.....J. W. Caldwell
Automobile-engine.....A. S. Krotz
Automobile wheel-drive.....T. G. Rowe
Automobile wind-deflector.....J. M. Patrick
Awning-fixture.....F. O. Berg
Baking-powder tester.....F. Kiely
Bar-bender.....J. T. Richards
Battery system, Combined primary and secondary.....J. G. Gagler
Bearing, Roller side.....J. F. O'Connor
Bearing wheel, Roller-.....A. Wulff
Bearings of textile machinery, Means for protecting roll-.....J. L. Patterson
Bed, Folding.....J. Lyons
Bed, Sofa-.....L. G. Inrig
Beehive.....G. R. Sinnickson
Belt-fastener.....C. S. Eaton
Binder or loose-sheet holder, Temporary.....H. F. Bushong
Binder, Temporary.....G. H. Moore
Binding-post.....H. E. Leppert
Binding-post.....A. Lungen
Block-signaling system.....F. F. Brush
Blow-offpipes, Protector for.....A. R. Chambers
Blower, Rotary.....L. E. Fagan
Board, Apparatus for manufacture of composition.....J. Ferla
Boards, Manufacturing composition.....J. Ferla
Boat-lowering device, Life-.....C. J. Christensen
Boiler low-water signal.....J. L. Setzer
Boiler water-circulator.....C. C. Eckliff
Bone-black kiln.....B. Eba
Bookbinding, Cloth.....M. Taprogge
Boot and shoe separable fastener....J. Jepperson
Bottle.....O. Papp
Bottle.....E. T. Greenfield
Bottle-filling machine.....J. M. Falls and L. P. Williams
Bottle-lock.....W. H. Bryan
Bottle washer, Milk-.....W. W. Haggard
Bottler's apparatus.....G. J. Meyer
Bottling-machine.....J. H. Camp
Bowling-alley surfacing machine.....G. B. Gonia
Bowling-pin.....B. Merklen
Brake.....E. Herold
Brake-beam.....H. Ziemss, Jr.
Brick-machine.....P. J. Mead
Brick-machine.....C. M. Starr
Bridge.....J. F. Kaspar
Brush-holder.....E. R. Knight
Buckle.....A. Bienenzucht
Buffing-machine.....J. J. Heys
Buggy-top support, Yielding.....C. P. Johnson
Building-block, Interlocking.....B. Benas
Burglar-alarm.....M. Korbel
Buttonhole-machine.....H. C. Miller
Cabinet.....C. M. Hutchinson
Cabinet, Light-...C. F. McClure and W. I. Shuman
Can closure, Powder-.....G. W. Childs
Can-opener.....A. C. Lemm
Cans and the like, Machine for washing.....J. L. Ranney
Canceling machine, Ticket-.....W. C. Fisk and J. A. Seely
Cant-hook.....J. B. Snyder
Car-brake.....W. J. Stahr
Car construction....T. Dunbar and L. J. Berg
Car-coupling, Emergency.....E. Posson
Car, Dump-.....J. Pearson
Car-fender.....T. J. Killeen
Car-fender.....C. D. B. Fisk and D. R. Smith
Car-frame.....E. Posson
Car, Hand-.....J. Marshall
Car heating and ventilating apparatus.....F. H. Farrington
Car-roof.....J. Pearson
Car-step, Folding.....G. F. Brandau
Car-switch-operating mechanism....F. G. Eibel
Car underframe, Railway-.....E. Posson
Car wind-screen, Motor-.....J. Hodgson
Cars, Grass-cutting attachment for.....W. J. Clarke and S. A. Stream
Carbureter.....J. R. Nye
Card-table.....M. B. Samuel
Caster for gymnasium apparatus.....F. Medart
Casting apparatus.....A. Casey
Cement-pot.....H. W. Lawson
Cementitious composition and making same.....W. E. Carson
Chair-iron.....H. W. Bolens
Check, Barber's account-.....J. Church
Chime, Electric.....J. E. Scovill
Chimney, Ventilating-.....J. M. McIntosh
Churn.....O. D. Welds
Cigar end or tuck forming machine....R. Helms
Cigarette and match box.....S. Schendel
Circuit-breaker, Automatic magnetic.W. M. Scott
Clock.....R. C. Saloch
Clock, Pendulum-actuated.....E. W. Vaill, Jr.
Clutch.....T. H. Gerrard
Coating device.....G. H. Hardman
Coin-detector.....H. T. Werden
Collapsible box or crate.....G. A. Shraud
Comb.....W. Jacobs
Combustion-engine.....C. S. Piestrak
Composition of matter.....F. J. Conboy
Compounds and mixtures, Method and apparatus for determining proportions in.....L. Taylor
Concrete-block-molding machine.....C. Colwitz
Concrete floor construction, Reinforced-.....U. S. G. Athey
Concrete, Means for filling holes with.L. E. Welsh
Concrete sidewalks, curbs, &c., Apparatus for laying.....E. L. Ransome
Concrete slabs, Production of hollow reinforced-..M. Milankovitch
Concrete-steel construction.....W. Mueser
Concrete structures, Mold for making.....J. M. Timmons
Concrete-tile mold.....B. T. Beckman
Condenser, Steam-.....R. D. Tomlinson
Conduits, Devices for joining parts of.....G. M. Wehrle
Connector.....T. A. Hammond
Cooking shelled peanuts,&c., Machine for.C.O Roe
Copper-nickel and other metals from copper-nickel matte, Separating.....H. L. Wells
Copy-holder.....F. M. Giddings
Cotton-chopper.....N. Robinet
Cotton-picker.....W. A. Phipps
Counting apparatus, Automatic...G. F. Richmond
Coupling mechanism.....W. D. Leftwich
Cuff-holder.....W. S. Arnold
Culinary utensil.....W. Quinby
Cultivator.....W. E. Johnson
Cup attachment, Drinking-.....D. M. Simpson
Curb-corners, Nosing for.....W. S. Clifford
Current-collector.....G. R. Forster
Curtain-hook.....C. H. Maass
Cycle and bicycle stand, Motor-..F. C. Hoffer, W. H. Whitesell, and F. H. Bente
Dental instrument.....S. Quigley
Dental instrument.....O. Neugebauer
Derailer.....J. T. Farrell
Die, 2 patents.....L. Swank
Disinfecting apparatus.....P. J. Walsh
Disk tongue device.....J. C. Roath
Display device.....W. Marks
Distributer.....J. W. Le Gore
Door.....A. A. Wheeler, M. V. Haskins, and A. H. Wheeler
Door-fastening device.....M. Ritchel
Door-hanger.....A. Theyskens
Door-hanger.....W. D. Ferris
Door-stop.....D. Crockett
Double-acting switch.....C. J. Spellman
Draw-box (reissue).....E. H. Rooney
Dressing-machine reel.....R. Knebel
Drier.....C. E. Geiger
Drying apparatus for tea, grain, &c.S.C.Davidson
Drip-pan.....J. Menzl and B. L. Schwartz
Driving mechanism.....J. J. Walser
Driving mechanism, Variable-speed..J. J. Walser
Driving mechanism, Variable-speed.....H. C. Schroeder
Driving mechanism, Variable-speed, 2 patents...J. J. Walser
Dumping-elevator, Automatic....G. E. Richmond
Dust detonations, Device for preventing.....P. Schuster
Dust-pan.....W. E. Ballman
Dust-separating tank.....D. Fogarty
Dye and making same, Azin.....P. Ott
Dye and making same, Brown vat.....G. Engi and H. Kappeler
Easel.....E. Oldenbusch
Educational device.....R. M. Vick
Egg-case, Foldable metal.....A. R. Burleson
Egg-separator...P. A. Bayless and C. F. Redman
Egg-tester.....W. Rigling
Eggs, Mold for making nest-....J. M. Southerland
Elastic-fluid engine.....C. V. Kerr
Electric circuits, Protective device for.....S. R. Bergman
Electric conductors, Safety device for overhead...E. Giraud
Electric generator.....E. T. Kenney
Electric heater, Luminous.....W. F. Howard and A. B. Cousins
Electric light, Incandescent.....J. T. Bigger
Electric machine, Dynamo-.....C. P. Steinmetz
Electric machine, Dynamo-.....B. A. Behrend
Electric separator.....G. D. Rogers
Electric switch.....O. M. Knoblock
Electric receptacle.....G .W. Goodridge
Electricity in moving material, Apparatus for neutralizing.....W. H. Chapman
Electricity, Means for neutralizing static.....W. H. Chapman
Electricity, Process and apparatus for neutralizing static.....W. H. Chapman
Electrode element for storage batteries.T.A.Edison
Engine construction, Gas or gasolene.C.Herreshoff
Engine igniting apparatus, Explosive-.....B. F. Stewart
Engine ignition system, Explosion-.....P. R. Werner
Engines, Sileneer for internal-combustion.....W. L. Tobey
Engines, Spark-plug for internal-combustion.....M. Eyquem
Engines, Under-water exhaust-outlet for internal-combustion.....W. L. Tobey
Engraving-machine.....P. J. Meyer
Eraser-cleaning machine.....J. A. Jones
Etching-machine.....H. Schedler
Evaporating apparatus.....J. Parker
Excavating apparatus.....A. E. Lehmann
Excavator, Drainage-.....M. G. Bunnell
Explosive.....C. U. Buck
Explosive grenade.....F. M. Hale
Explosive-mixing machine.....H. Talley
Farrier's implement.....W. Rawalt
Faucet.....J. Falasca
Faucet.....A. J. Robinson
Faucet, Beer-.....T. Davis
Feed-bag.....T. Brennan
Feed mechanism, Differential positive-..R. Milne
Feeder, Stock-..J. Z. Loop and G. R. J. Newman
Fence-post.....J. O. Mace
Fertilizer-distributer.....E. C. Galloway
Fertilizer-distributer and planter, Combined.....F. W. Decker
Filling device.....J. Papish
Filling-machine.....F. C. H. Strasburger
Fire-escape.....A. A. Jahnke
Fire-extinguisher apparatus.....H. V. R. Read and R. H. Campbell
Firearm, Magazine-.....J. Rebman
Fish-hook.....W. E. Koch
Fishing-reels, Drag-handle for....T. M. Williams
Flat-iron, Self-heating.....C. S. Konigsberg and W. Allen
Flower-supporter.....A. Heim
Flue-cutter.....J. M. Wenzel
Fluid-distributing comb.....V. Sartell
Fly-book.....S. E. Creasey
Folding box, 2 patents.....H. L. Gulline
Folding chair.....F. M. Burrowes
Folding table.....F. W. Anderson
Frog, Hard-center..W. H. Dotter and R. S. Hays
Frog, Reversible...W. H. Dotter and R. S. Hays
Fruit-jar.....H. B. Burns
Fuel-feeder.....W. H. Harding and C. M. Saeger
Furnace.....J. R. Fortune
Furnace fire-door.....J. R. Fortune
Furnaces, Rabble for ore-roasting....A. V. Leggo
Gage-movement frame.....F. C. Blanchard and E. B. Crocker
Gambrel, Hog-.....C. G. Coultas
Garbage-can and rubbish-burner, Combined.....E. D. Smith
Gas and carbureted water-gas, Manufacturing mixed coal-.....W. Thomas
Gas generator, Acetylene-.....Z. A. Ferrel
Gas-lighter.....F. H. Pomeroy
Gas lighting and extinguishing apparatus.....V. C. J. Nightingall
Gas-lights from a distance, Apparatus for lighting and extinguishing.....J. F. Nossen and A. E. T. Bergstrom
Gas-main stopper.....P. Goodman
Gas-mantle-fixture shock-absorbing device.....H. E. Woods
Gas-producers, Vibratory disintegrator for.....J. J. Astor
Gas-washer.....W. Feld
Gases, Apparatus for purifying burner-.....J. B. F. Herreshoff
Gases, Purification of burner-..J. B. F. Herreshoff
Gasolene-engine.....J. C. Johnson
Gate.....J. E. Mullen
Gate-hook.....C. L. Smith
Gate-operating attachment.....J. B. Faulkner
Gear-train, Double-pinion toothed..W. Trewhella
Gearing.....H. C. Schroeder
Gearing, Friction-.....J. H. Graham
Glassware, Mechanism for producing hollow.....C. J. Koenig
Grader, Road-....A. W. Hadley and H. M. Smith
Grain-drier.....P. Provost
Grass-crimping apparatus.....W. F. Wyman
Grate, Revolving.....A. L. Wilson
Grinding-machine.....C. H. Norton, J. C. Spence, and H. N. Cudworth
Grinding-machine driving-gear..J. M. Thompson
Grinding-mill.....J. C. Clark
Gun-hose, Automatic.....G. L. Wetzel
Hames-fastener, Adjustable.....J. Oppenheim
Hammers, Die-holder for drop-....W. F. Gorton
Hammers, Water attachment for pneumatic.....C. T. Carnahan and J. Murphy
Harness.....H. H. Crawford
Harrow.....R. C. Bowman
Harrow, Disk.....C. S. Sharp
Harrow, Guarded-end steel-lever...W. E. Johnson
Harvester, Beet-.....G. A. Pingree
Hat.....J. R. Rash
Headlight-cover.....C. W. Houghton
Headlight, Locomotive-.....S. W. Emery
Heat-transmitter.....H. Friedenthal
Heating apparatus.....N. B. Wales
Hinging-gage.....W. H. Gelbaugh
Hod.....H. McLane
Hoisting apparatus.....G. Hammond
Holdback.....M. D. Schaller
Holder.....G. Stocker
Horseshoe.....G. Loeffler
Horseshoe-calk former.....E. N. Childs
Hose-supporter.....E. C. Scruggs
Ice-creeper for horseshoes.....G. H. Echols
Ice harvesting and cutting apparatus, Plate-.....D. J. Havenstrite
Ingot-mold.....E. Gathmann
Insect-catcher.....E. Attaway
Insole or support for deformed feet.....I. Tauber
Insulating fabrics, Making.....C. F. Petersen
Kinetoscope.....J. J. Pink and J. Fletcher
Knife and fork scourer.....W. D. Holmes
Knockdown box.....T. A. Brenner
Labeling-machine.....F. O. Woodland
Lacing tool and square, Belt-....H. T. Mumford
Lamp.....E. Schmidt
Lamp attachment, Mercury-.....C. P. Steinmetz
Lamp-chimney.....G. H. Lee
Lamp-globe.....A. H. Humphrey
Lamp shade, Electric-.....N. C. Bebin
Lathe-tool, Combination.....O. Carlborg
Lathe-tool holder.....J. and W. Carr
Leather and the like creasing machine.....E. B. Stimpson
Leather cutting, beveling, splitting, and grooving machine.....C. Hildebrandt.
Ledger, Self-indexing loose-leaf..P. W. Schwander
Lemon-squeezer.....J. Wiendl
Lens-grinding machine.....F. Buchhop
Lifting-jack.....E. Cook
Lightning-arrester.....C. T. Mason
Lightning-arrester.....E. W. Vogel
Lip-turning machine.....W. H. Hooper
Lip-turning machine, Channel-.....W. H. Hooper
Liquid-fuel-burner.....R. M. Hammond
Liquid-fuel-combustion engine.....H. R. Setz
Liquids, Filling apparatus for.....S. Schlangen
Lock.....B. Borland
Lock-escutcheon.....P. K. Magruder
Locomotive-tender frame.....C. H. Howard
Log-loading apparatus.....A. W. Kurtz
Logging-car standard attachment....M. Majette
Loom for weaving tufted pile fabrics.....J. P. Humphries
Loom let-off mechanism, Narrow-ware-.....G. W. Kuenneth
Loom-warp, Means for applying wax to.....W. F. Mintel
Loom weft-replenishing mechanism, Automatic...M. L. Stone
Looms, Differential filling-supply-gaging device for.....S. S. Jackson
Lubricator.....J. A. Martin
Lubricator.....R. C. Agner
Magnetic separator.....W. B. Moore
Mail-bag catcher.....W. Wever
Mail-bag deliverer.....H. J. Sanderson
Mail catching and delivering device for railways.....W. M. Moloney
Mail-crane.....H. J. Hedrick
Mail-delivery car, Rural-.....W. B. Yarberry
Mail-marking machine.....W. Barry
Mailing-tube.....V. Guertin
Malt-kiln.....O. H. Luebkert
Mantle, Incandescent.....O. Kaufmann
Match-safe.....W. G. Monk
Match-safe.....J. E. Gearhart
Matrices, Producing.....P. T. Dodge
Measuring device, Chest-expansion-..C. W. Kennedy, E. W. Carlson and N. C. Jeffes
Measuring instrument.....O. W. Dolph
Measuring instrument, Electric, 2 pats.A. H. Hoyt
Measuring tank, Liquid-.....T. L. Smith and E. W. Meyer
Metal-working machine.....F. W. Sanford and N. Marshall
Metal-working machines, Work-support for.....W. F. Zimmermann
Metallic tie.....M. F. Bonzano
Meters, Gearing for.....A. F. Hintze
Milk-heater.....A. H. Schlueter
Mine, Submarine.....A. P. Broomell
Mirror.....H. Varder
Mirror, Portable.....C. W. Angell
Mixtures, Obtaining intimate.....E. Dor-Delattre
Moistener and affixer, Automatic stamp.W.Z.Bean
Moistening device.....L. W. Homire
Mold.....J. R. Kay
Molding articles.....L. H. Baekeland
Mortar or concrete mixer.....A. M. Peterson
Motor-control system.....E. F. W. Alexanderson
Motor-control system, Electric-..A. C. Eastwood
Motor-starting apparatus, Electric-..S. B. Paine
Motors, Arrangement for regulation of speed of compensated single-phase.....E. Arnold and J. L. La Cour
Music-turner.....E. E. Van Dine
Nail-puller.....L. Scarbrough
Nozzle, Spraying-.....A. E. Preston
Nut and wrench, Combined.....A. A. Friz
Nut-lock.....M. H. McCoy
Nut-lock.....L. S. Brach
Nut-lock.....T. Loughlin
Obstetrical device.....H. J. Barnes
Oil-burner, Automatic.....A. H. Light
Oil-cloth-cutting knife.....A. H. Fesemyer
Oil-cup for planes.....D. James
Oiling device for gas-meter diaphragms, Automatic.....J. R. Daly
Oven, Baker's.....W. Schoenhaar
Package, Metal.....J. H. La Fave
Packing and display case.....F. S. Ferry
Packing reciprocating pistons and the like, Means for.....S. Robinson
Pail, Dinner-.....E. M. and G. L. Adams
Pail, Milk-.....C. E. Shreve
Pallet-setting implement.....G. W. Riebe
Paper-bag machine.....E. E. Claussen
Paper-bag machines, Diamond-fold-forming mechanism for.....C. D. King
Paper-bag-manufacturing machine...E. F. Muller
Paper box.....C. B. Davis
Paper-box-covering machine..C. W. MacDonald
Paper decoration.....A. Simonson
Paper-roll holder.....H. C. Rosebery
Paper receptacle.....G. H. Griffiths
Pastry-cutting machine.....E. B. Coburn
Pen nib, Fountain-.....D. Cameron
Pencil, Polypoint.....J. C. Haring
Pencil-sharpening device.....R. W. Pittman
Petroleum-burner.....W. H. Eaton
Phonograph-records, Apparatus for making duplicate.....J. W. Aylsworth
Phonographic needle.....A. J. Smith
Phonographic recording and reproducing machine.....T. A. Edison
Photographer's range-finder.....G. B. Brayton
Piano-action.....F. Meyer
Piano attachment, Automatic-.....J. Sampere
Piano case, Upright-.....C. Mayer
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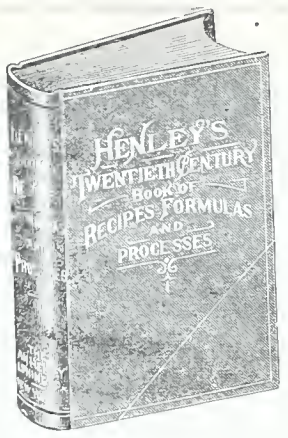

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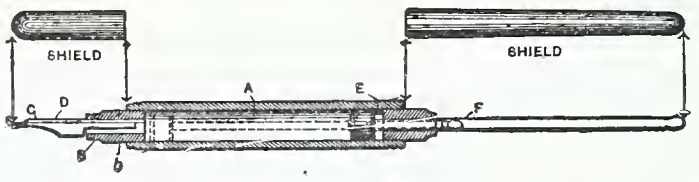

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SUBMARINES FOR THE AUSTRO-HUNGARIAN NAVY.

By E. OMMEGANCK.

THE accompanying illustrations show Austro-Hungarian submarines, Fig. 1 depicting a boat during her trial trip, and Fig. 2 showing another in course of construction at the shipbuilding yard. The under-water displacement of the boats is 300 tons, and the surface displacement about 235 tons. Their leading dimensions are: Extreme length 142 feet, breadth twelve feet four inches, draught surface nine feet eight inches.

The vessels have a double hull, the inner one being a cigar-shaped water-tight body with a structural strength calculated to resist hydraulic pressure corresponding to a depth of 165 feet. This inner hull is shown in Fig. 2. The water-tight hull is formed of nine circular welded sections, three of which, amidship, are cylindrical, and the others, fore and aft, slightly conical. This hull is subdivided by means of bulkheads into several water-tight compartments. The bow section contains the torpedo armament and accessories; the next section, the crew accommodations, the storeroom for electrical batteries, a galley with electrical cooking range, and lavatory accommodation. The inner ballast tanks are situated amidship, and just below the conning tower is placed the steering gear for the two pairs of dividing rudders. The engine room contains internal combustion machinery and electrical motors, and the last water-tight compartment aft is reserved for another battery of accumulators.

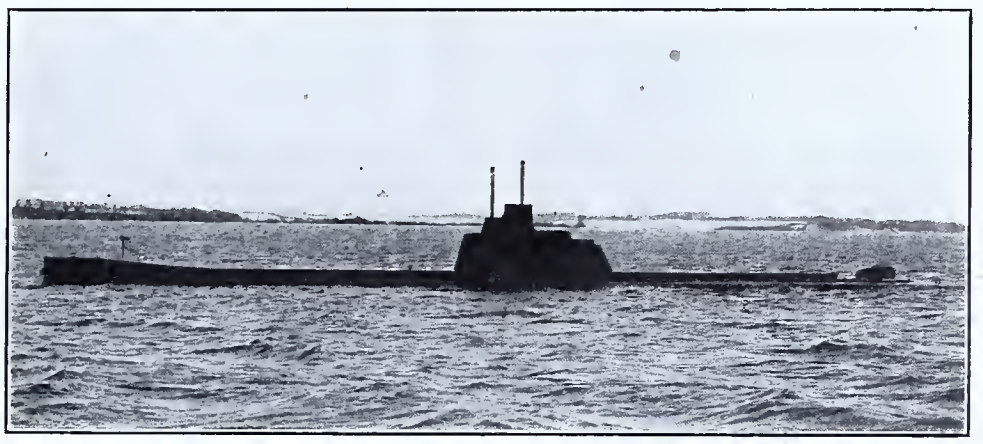


FIG. 1.—SUBMARINE ON TRIAL TRIP.

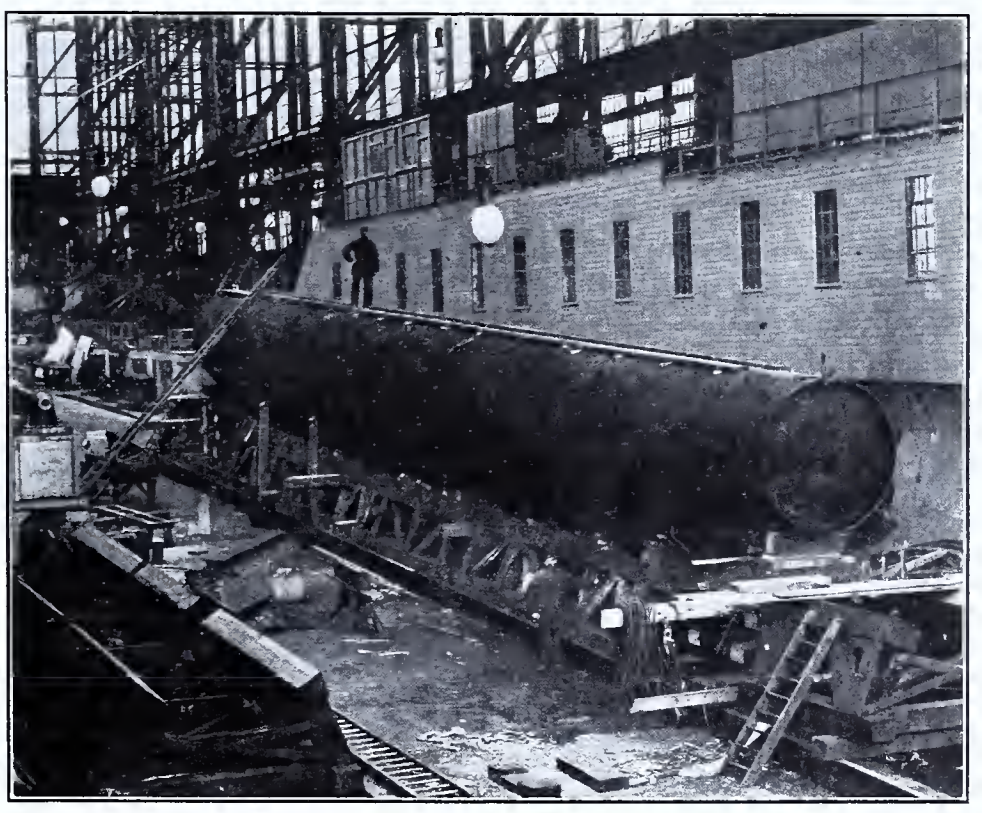


FIG. 2.—INNER HULL OF SUBMARINE.

The outside hull does not differ much in shape from an ordinary torpedo boat, being designed to give the boat good sea-going. A weather deck extends almost the whole length of the ship, and can accommodate the crew when the boat is travelling on the surface. Between the deck platform and the inside hull all the kerosene and most of the water-ballast pipes are fitted.

The conning tower, situated amidship, is framed of strong nickel steel plates capable of resisting the attack of small guns. It is fitted with two periscopes, and all the appliances necessary to control the ship in action. The only opening which gives access to the vessel is placed immediately above the conning tower. Communication between the conning turret and the steering gear below is effected by means of voice pipes. Aft of the conning tower is a conning platform for surface navigation. The tower is enclosed in a structure, designed to diminish the resistance met when traveling under water.

These submersibles are propelled by two-cycle heavy oil engines, aggregating 600 horsepower for surface navigation. Two electric motors, designed to develop 320 horsepower, are used for propulsion when the boat is submerged. The motors operate two reversible screws.

The engine-room outfit comprises main and auxiliary motor-driven bilge pumps, hand-worked bilge pumps for exhausting bilge and ballast water, air compressors and all accessories.

A particular feature of German submarine naval policy is the provision made for salving appliances, which, in a way, have preceded the construction of submarine craft. This feature is emphasized in these boats. They carry a safety heel weighing five tons, which can be detached, through a very simple gear, by the movement of a handle. By emptying the ballast tanks the boat can be floated in one and one-half minutes. Several appliances have been devised to purify vitiated air, and thus prolong the

stay under water, so that the liability to accidents is greatly minimized. Air connections are fitted on the plating which, under certain conditions, would allow communication to be made with the atmosphere. A buoy carried on deck can be unfastened from the inside of the hull, in order that telephonic connection can be established with a rescuing crew. Each boat is fitted with two 18 inch Whitehead torpedo tubes, and carries a supply of three torpedoes. The surface speeds at trials was 12 knots, but it is anticipated that it will be surpassed in deep water tests; the submerged speed is 8.6. knots. At an economic specd of 10 knots, the radius of action is given as 1200 miles above water, and 60 miles submerged, the speed in the latter case being 6 knots. One boat was submerged to the greatest intended depth—75 feet—in order to test water-tightness, and remained two hours under water with twenty-five hands on board. After the trial the boat was floated in one and a half minutes by exhausting ballast water.

The performance of this type of ship is responsible in a large measure for the increasing favor with which the sea-going submersible torpedo boat is regarded in Austria and Germany.

Registering Letters by Machinery.

Drop a coin in the slot and get your letter registered. This is the latest novelty in France, and it is said to be so successful that the apparatus will be introduced on this side of the water. The French government is responsible for the innovation, and a nickel coin, worth about 5 cents, is used to operate it, as this is all it costs to get a letter registered in that country. The machine works in the ordinary way; the letter is dropped into a box, the coin put in, the crank turned, and a numbered receipt falls out, the corresponding number being simultaneously stamped on the letter.

The ingenious feature of the machine is the device for preventing the use of any except the nickel coin. This is accomplished by means of a magnet, which attracts only iron and nickel, the latter very feebly. The attraction is so carefully calculated, however, that it is sufficient to cause the coin to fall into the pocket which operates the machine. An iron piece is so strongly attracted that it would miss the pocket; and all other coins, not being drawn at all, are rejected. Some such device will have to be put into operation to protect the telephone company in this country. Since the issue of the new Lincoln penny pieces, these have been used freely in place of the nickels intended to pay for phone messages. It did not take people long to find out that the new pennies are slightly larger and heavier than the old ones, and when dropped in the slot cause the bell to ring with as much emphasis as if they were worth five times their value. The telephone officials have been at their wits' end to meet this emergency.

A GLOBE CLOCK.

By FRANK C. PERKINS.

The ingenious British Empire Clock shown in the accompanying illustration gives the correct time all over the world, and demonstrates the actual rotation of the earth on its axis in twenty-four hours, and the speed of the earth. It shows at a glance the difference in time between all places on the earth's surface and the current mean time at any town or place in the Eastern or Western Hemisphere.

This remarkable clock enables teachers of public schools and colleges to demonstrate the daily rotation of the earth from west to east and the difference in time caused by this rotation corresponding to the difference in longitude, or 15 degrees longitude

east or west with one hours difference, and four minutes for each degree east or west of the standard meridian. It shows the exact position of every place in the world in relation to the light of the sun, i. e., day or night. The circumference of the Empire Clock is approximately 25 inches, and therefore the rate of speed is a little over one inch per hour. The earth, four inches from its center, is actually travelling at this speed.

The speed on the surface of the earth decreases from the equator toward the poles. This can be demonstrated most easily on the Empire Clock by measurement on the different parallels of latitude. In considering day and night, any line drawn from the north pole to the south pole on the surface of the earth, cutting the equator, is called a meridian of longitude. When one of these lines passes the sun the time is mid-day at that point. The corresponding line on the opposite side of the world has mid-night. This can be easily verified on the Empire Clock. Red figures indicate day, and black, night. On March 22, and September 22, the world has a 12-hour day and a 12-hour night. An adjustable and movable guide with a pointer turns with the globe, clearly indicating on the hour ring the actual time at any place. The guide has a small knob to enable it to be turned eastward by the hand, without changing the position of the globe, and it can be set over any town where the chronosphere is to be permanently used. For example, the chronosphere is being permanently used in London and the guide is adjusted to stop over London. The pointer indicates London Greenwich mean time, and it is required to ascertain Calcutta time. The guide is brought over Calcutta, and the pointer will indicate exact Calcutta time in the ring dial. The guide is then turned eastward and when it is brought over London it will stop and click, denoting that it is over the place where it is adjusted for permanent use, the pointer indicating correct London time. The sun attachment for use in schools (fixed on the chronosphere without additional cost) shows the height of the sun in degrees above the horizon for every day of the year.

With this novel clock, when a liner arrives at any port, the exact time at that port can be read, and watches and clocks timed accordingly. For cable messages the value will be at once apparent.

The sun attachment can be replaced with another ball (to represent the moon) or for the time being the sun can be called the moon. As the earth turns, each part of the ocean is brought directly under the influence of the moon. This action tends to lift the water immediately under it and to produce a higher level, which we term high tide. The same effect is produced on the other side of the earth, thus causing approximately two high tides per day and two low tides per day, the tide flowing for six hours and ebbing for six hours. Other interesting facts as to the ocean currents, trade winds, land breezes, typhoons and monsoons are clearly demonstrated by the use of this unique clock.

A Magnified Compass.

A card compass of reduced diameter is interesting people in marine circles. Is is an improvement on those now generally in use, in that it secures the magnifying of the markings, and permits the use of cards of smaller diameter than those of the old time compass. Compass cards of large size have the drawback that they are unsteady in a sea way, owing to the periods of vibration and inertia. Lens magnifiers have been used, but these cause the same strain on the eyes that would result from the use of strong spectacles. In the new device, a magnifying mirror is placed inside the compass on the forward part, so that the top of the compass may be removed without affecting the mirror. To the compass card is added a downturned rim on which are the degrees or marks, the figures being reversed so that they show normally in the magnifying mirror. Instead of the steersman viewing the compass direct, he steers by the magnified image shown in the mirror, and the least movement of the vessel is at once detected. Closer and more accurate steering is attained by the new eard compass, and as the helmsman is viewing the magnified reflection and not the object directly through the magnifier, there is no strain on the eyes. Exhaustive practical tests made at sea under various weather conditions have proved the success of this new system of steering.

NEW BOOK.

GAS, GASOLINE AND OIL ENGINES

By GARDNER D. HISCOX, M. E.

There is probably no more important mechanical industry, involving the production of motive power for all purposes within the age of steam, than that of the explosive motor. So quickly has this new power expanded to almost universal usefulness as a labor-saving element for the lesser industries, that the literature of the past is found lacking. The progress made in adapting the use of crude petroleum as fuel, together with the rapid development of the producer gas industry, have given a new economy to the production of power, while the use of the hitherto neglected gaseous elements of the blast furnace and coke factory, have added new sources of production at a nominal cost. It is estimated that there are about 600 manufactories building gas, gasoline and oil engines in the United States, and the user can now select the kind desired for his special needs. The safety, economy and easy management of such engines have made in their adoption as agricultural helpers a marvelous inroad on the old fashioned hand and horse powers, and they are now reaching a new place as a ready means of power in pumping and irrigation, for driving threshing machines and wood saws, for operating mowers and reapers. For marine purposes, for automobiles, and even of late for air navigation, gasoline engines have shown their adaptability. A recent book dealing with this subject, Gas, Gasoline and Oil Engines, by Gardiner D. Hiscox, M. E. is therefore especially timely. It has been rewritten and brought up-to-date, (18th edition) with the object of keeping gas engine owners in touch with the latest phases of construction and operation of these devices. The book treats of the theory of the engines. Explosive motors for stationary, marine and vehicle power are described. Electric ignition by ignition coil and jump sparks are fully explained, and valuable information given as to testing for economy and power, and the erection of plants. The special data as to producer and suction gases included cannot fail to prove of interest. The volume is fully illustrated by over 400 engravings and diagrams. It is published by the Norman W. Henley Publishing Co. 132 Nassau Street, New York, U. S. A.

MOTOR-DRIVEN ROCK DRILL.

By C. VAN LANGENDONCK.

THE electric rock drill herewith illustrated can be used in boring rocks of any hardness. It is operated by a 1 horsepower motor, fitted directly to the drill, and is said to be far more efficient than the ordinary devices of this class.

The electro-motor is located in a saddle in the back of the drill and is readily removable. The drill weighs 224 pounds, exclusive of the motor: the weight of the latter is 106 pounds, and only two men are required to operate the machine. Like the drill itself, the motor is enclosed in a dust and water-proof casing. Current is supplied through flexible well-insulated conductors, wound upon transportable drums in lengths of 213 feet to 330 feet. These cable drums are located permanently near the connection box, which contains the terminals of the stationary circuit and fuses for each pole, the length of the conductor actually used being wound off the drum. At the loose end is attached a substantial plug, designed for rough handling, which fits into a contact box of the motor. After fitting this plug, the operator has only to turn the crank situated on the motor to start the latter as well as the drill.

The motor drives, through a spur wheel gearing, a double-bearing crank shaft provided with a fly-wheel, which in turn effects the alternate motion of a slide. In the latter are incased the two working springs surrounding the impact piston, keeping between them the flanged impact box, which is susceptible of rotation, but not of longitudinal motion on the piston. The reversal of the drill after each stroke is effected in the well-known manner, by means of a nut with one sided click which engages with the elongated thread of the impact piston. The click-holder of the ratchet nut is located on springs, so as to prevent any damage to the nut.

According as the drill is working on the right or left side of the supporting column, the motor is placed above or below the drill. The difference in location exerts no influence on the working of the drill; it may be employed as well on a horizontal column or transportable supports, provided it is fitted with a special feeding slide.

DRILL ON TRIPOD FOR QUARRY WORK.

DRILL ON RIGHT OF COLUMN. THE MOTOR IS FIXED ABOVE THE DRILL.

With a convenient fitting, the drill can be used as well for cutting and cleaning.

This electric crank impact drill can be used in boring rocks of any hardness. The initial diameters of a bore vary in general between 1½ and 2 inches, the adoption of a smaller diameter being advisable only in the case of very substantial rock. A length of 2 to 4 inches per minute can be drilled in hard granite with one and one-half to one and three-fifths inches of bore and a length of six inches to one foot in sandstone, according to the hardness of the latter. For drilling soft rocks or earth, however, a rotary drill of lighter and cheaper construction should be used.

A special advantage of the crank drill illustrated is its low consumption of energy, six drills being operated at a time with an expenditure of 10 horsepower. The amount of electrical energy consumed by each machine is one kilowatt, and no energy is used up during the exchanging or shifting of the drill, the motor being then stopped.

Development in Turbines.

The steam turbine has made rapid progress, not only on sea but on land. It is a striking fact that eight years ago there were only 25,000 horsepower of marine turbines afloat. Two years ago there were some 800,000, and now there are upwards of 2,000,000 horse power completed and under construction. It was on land that it first came into general use, and the increase in the size is the striking feature of the last few seasons. Eight years ago a 1,000 kilowatt machine was regarded as a giant; now they are made as high as 800,000. The turbine is also finding application to new uses, such as driving air compressors, pumping water and for blast furnace work. In many parts of the country reciprocating engines are running non-condensing, and it has been found that the exhaust steam from them is of great value. This cannot be properly utilized by reciprocating engines on account of the huge size and volume of the cylinders required, but it is quite otherwise with the steam turbine, where the large volumes of low pressure steam are just what is desired for the highest economy. These considerations have led to the introduction of exhaust steam turbines, taking steam at atmopheric pressure and exhausting into a condenser. The power of a non-condensing plant can be doubled by the addition of an exhaust steam turbine and condenser, and in cases where there is not a supply of cooling water, improvements in cooling towers have enabled them to be put up both cheaply and well. This use of exhaust steam has been facilitated by the employment of the thermal accumulators in which the intermittent supply of steam is alternately condensed and re-evaporated, so that a constant flow is obtained for the use of the exhaust steam turbine.

Another improvement is the use of mixed pressure turbines, in which there is a low pressure part, sufficiently large to give full power when working with exhaust steam. If the supply of this fails, a high pressure part is brought automatically into action, using steam direct from the boilers, so that there is economy in running, whether the reciprocating engines supplying the exhaust steam are working or not.

But it is in marine work that the greatest strides have been noted in the development of the turbine. The great steamers Lusitania and Mauretania have not only proved themselves to be the fastest liners afloat, and the turbines have worked satisfactorily, but the system has proved economical as well. It was a long step from the 8,000 horsepower of a cross channel boat, which was the largest made for this purpose before the Cunarders were launched, to the 65,000 horsepowers of the latter, and the success reflects great credit on the ability of the constructors. More mistakes have been made, as the *Technical World* points out, in going from a small thing to a large one in engineering than in any other detail: but the various pit-falls which awaited those responsible have been triumphantly avoided. The steam turbine has been used almost entirely for ships of 17 or 18 knots and above, and in fact it may be generally said that about 15 knots is the lowest speed of vessel at which the turbine can satisfactorily compete with the reciprocating engine as regards economy. The difficulty of the problem lies in the fact that at low speeds the screws have to be made to revolve slowly, and at the same time the horse power required is moderate, and thus the turbines have to be very large and heavy, and besides this the blades are so short that the loss by leakage is excessive. These considerations have led to the combination of a reciprocating engine for the high pressure part of the range where the volume of steam is small and where such an engine would work economically, and a turbine for the low pressure part of the range where the volume of steam is large and where, therefore, the turbine works to the best advantage. This arrangement is an improvement over either the turbine or the reciprocating engine for moderate speed, and it is believed that an economy of about 50 per cent can be attained in this way.

New Pneumatic Tire.

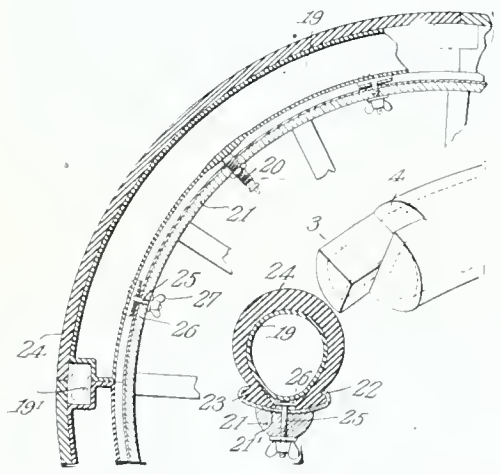
All those who use motors know the difficulty caused by accidents to tires. Whenever an ambitious trip is in view extra ones have to be carried. A Frenchman has invented a method of mending tires in sections, which promises relief from this annoyance. The new tire is pneumatic, but is made up of a dozen pieces, each to be blown up separately. If one is punctured, it can be removed and another substituted with a minimum of delay and trouble, and the whole is held in place firmly and substantially. A similar device is illustrated on page four of this issue.

CLEVER NEW PATENTS.

Pneumatic Tire.—Shoe Sewing Machine Attachment.—Racing Harness.—Steam Boiler Furnace.

Pneumatic Tire.

Although pneumatic tires occupy an important place on the market, they have serious disadvantages for which a remedy is being sought. A recent invention by Paul G. Muenchinger of Newport, R. I., with one-half interest assigned to Edward F. Shiek, of Brookline, Mass., embodies a novel design which promises to diminish the difficulties attendant upon the use of such tires. As they are now constructed, a single puncture puts the entire tire out of commission for the time being, and makes it useless until repaired. The object of the new device is to provide an inflatable tire composed of separate sections independently inflatable, and which can be independently removed or replaced in the event of injury. At the same time, the tire sections are so shaped that when assembled they will form a smooth, continuous tread, which will not produce any undesirable jolting or vibration. The illustration shows three separate views, one a longitudinal section of a portion of the

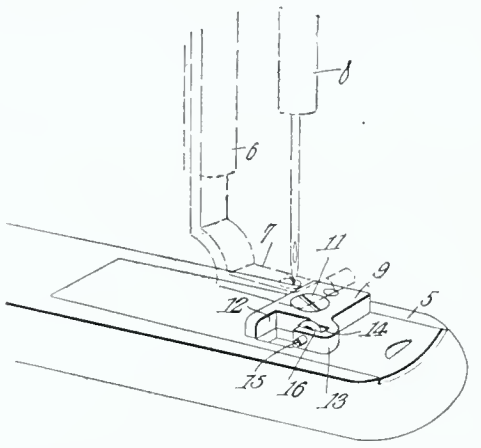


tire, another a transverse section, and the third a perspective view of the end portion of one of the sections, showing the lapping tongue and recesses 3 and 4, the purpose of which is to form a continuous tread, since the tongues of one section overlap and are received into the respective recesses of the other section.

Referring to the longitudinal section, it will be noted that one complete tube section 19 is shown, with the ends of two other sections. The outer tube 24 is also made in sections of the same length as the inner tube sections, and said outer sections are held in place by means of lugs consisting of threaded stems 25, and a bowed plate 26 attached to one end thereof and designed to press the enlarged edges 23 of the outer tube into engagement with the flanges 22 of the rim, as shown more clearly in the transverse section. A valved tube 20 extending through the felly of the wheel, is employed for the purpose of inflating the inner tube section 19. It will be understood that should any of the sections 19 become punctured, it can be readily removed and replaced without injury to the wheel, while the arrangement of the overlapping inflating tongues insures a continuous read under all conditions of service.

Shoe Sewing Machine Attachment.

Michael H. Sullivan, of Carbondale, Pa., is the inventor of a novel attachment for boot and shoe sewing machines, which is designed for producing a groove in the outer sole of the shoe, and for receiving and housing the stitches when sewing the outer sole to the welt. The groove prevents the stitches from coming in contact with the ground when walking, and thereby wearing out the thread. As shown in

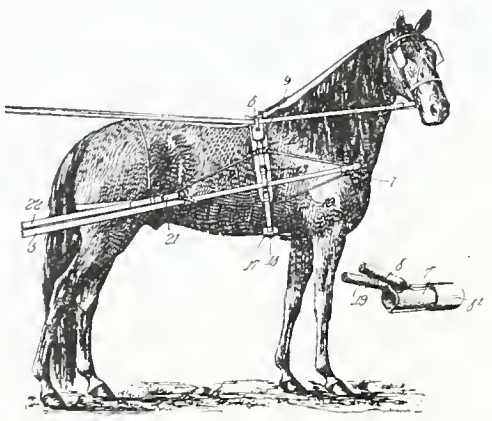


the drawings, the device comprises a flat plate 9 made of a single piece of metal secured in position by a screw 11, whereby it is held on the bed of a sewing machine. One end of the plate is formed with an opening 12 which registers with the needle-receiving opening in the bed plate, and is designed to accommodate the needle as the latter reciprocates. Extending laterally from the plate is an enlargement 13, having a slot in which is mounted a rotary cutter having its peripheral edge beveled in opposite directions to produce a cutting edge, adapted to form a groove in the lower face of the sole in advance of the needle.

The pin 15 on which the cutter turns is made detachable so that the cutter may be removed when it is desired to secure the sole to the welt without forming a groove in the sole. It will be obvious that different styles of cutters may be used for forming stitch-receiving grooves of different depths. The device is simple, and may be applied to a boot or shoe sewing machine at slight additional cost, and will fulfill all the necessary requirements.

Racing Harness.

A type of harness that is especially adapted for racing purposes, in that it permits unusual freedom on the part of the animal, has been patented by Hezekiah H. Crawford, of El Paso, Texas. It may be readily applied to

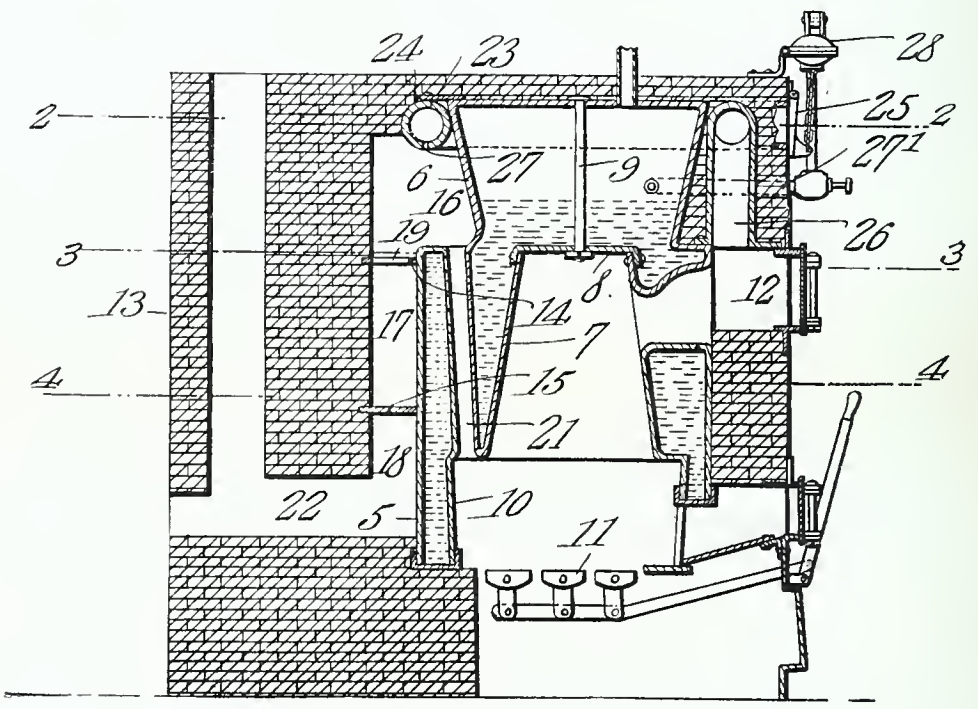


any ordinary sale harness, and "pivotally connects" the horse to the vehicle, so as to obviate the quick, jerky, up-and-down movement ordinarily imparted by the motion of the horse. A particularly novel feature lies in the construction of the connection between the trace and the saddle, which is in the form of a single strap, which works loosely through a loop carried by a thimble disposed upon the end of the shaft of the vehicle, and also loosely through a loop at the forward end of the trace. The provision of the loops and the arrangement of the strap allows for a freedom of movement which is not ordinarily attained.

Referring to the illustration, which shows the invention applied to a horse and a separate view of the thimble, it will be observed that the thimble, 7, is open at one end and closed at the other, and it is shown fitted upon one of the shafts. A loop is formed on the thimble, through which is passed the strap 19, preferably round in cross section. This strap is rigidly connected to a link 10 on the saddle by means of buckles and is passed loosely through a loop 21 at the forward end of the trace 22, and the lower stretch of the strap is rigidly connected at the bottom of the saddle to a ring. By this arrangement, the horse drawing the vehicle will be practically pivoted between the thill loops at each side of the harness, and as the animal rocks between the shafts, the strap 19 will work freely through the loop upon the thimble and the loop at the forward end of the trace. This construction provides against the stretching of one portion of the strap and the buckling of another portion at each movement of the animal.

Steam Boiler Furnace.

This invention, which was originated by Thos. Seevers, of Oskaloosa, Iowa, relates to a base burning, magazine steam boiler, and its object is to provide improved means of feeding air to the magazine and the combustion chamber, the air being heated before it is discharged in order to obtain a more perfect combustion of the fuel. The drawing illustrates a vertical sectional view of the boiler and the setting of brick work. It will be noted that the boiler is encased in the brick work so as to form a combustion chamber surrounding the boiler as well as the steam dome. Partitions 14 and 15 are located horizontally in the combustion chamber so as to divide it into compartments 16, 17 and 18. Said compartments communicate with each other by means of openings in the partitions.



The fuel magazine 7 is located centrally in the outer shell and is supplied with fuel through the chute 12. A series of flues 21 (only one flue is shown) surround the fuel magazine and are open at both ends, their lower ends communicating with the fire box 10 while their upper ends discharge into the compartment 16. A dome 6 is arranged above the fuel magazine and is of peculiar shape, as shown. The novel feature of the invention resides in the air supply pipe 23, which is designed primarily to supply air to the fuel magazine. This pipe is located at the top of the compartment 16 of the combustion chamber and partly surrounds the steam dome. In the bottom of the air supply pipe are a series of perforations 27 to supply air to the compartment 16. One end of the pipe opens through the front of the brick setting and is provided with a hinged damper 25. The other end of the pipe opens into a flue 26 which extends down through the brick work to the coal chute 12 and communicates therewith. By mounting the air supply pipe as described, it is exposed to the heated gases and other products of combustion in the compartment 16, whereby the air is heated before it is discharged into the magazine. It will be seen that the air is taken into the top of the magazine and passes down through the coal, whereby a more perfect combustion is obtained, and the fire will not clog up and cut off the air supply, as when it is fed from underneath the grate. The invention is of practical utility, and has much to commend it to manufacturers and users of furnaces.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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LIBERMAN'S EX'RS v. ROWELL et al.

(Circuit Court, E. D. Pennsylvania Nov. 30, 1908. 165 F. R. p. 208.)

PATENTS—INFRINGEMENT—CIGAR MACHINE.

The Liberman patent No. 668,921, for a combined cigar-rolling table and wrapper-cutter, covers a combination of old elements with a single new and limited feature, which is the vertical motion of the exhaust-box carrying the cutting knife, and is not infringed by a machine combining the same old elements with a different feature also old.

HOWARD v. GRIST.

(Circuit Court, D. New Jersey. Dec. 1, 1908. 165 F. R. p. 211.)

PATENTS — ANTICIPATION AND INFRINGEMENT—HUB GUARD FOR WHEELS.

The Howard patent, No. 753,264, for a hub guard for wheels, which is attached to the axle, was not anticipated and discloses invention; also held infringed.

UNIVERSAL CASTER & FOUNDRY CO. v. M. B. SCHENCK CO.

(Circuit Court, D. Connecticut. Nov. 25, 1908. 165 F. R. p. 344.)

1. PATENTS—REISSUE—VALIDITY.

A patentee may extend his claims by a reissue, when the invention remains the same and there is no material change in the drawings and specification.

2. PATENTS—ANTICIPATION—INFRINGEMENT—FURNITURE CASTER.

The Diss reissue patent, No. 11,982 (original No. 654,956,) for a furniture caster, was a legitimate reissue, within the invention disclosed by the specification and drawiugs of the original application, and was not anticipated, and is valid. Claims 1 and 2 also held infringed.

WOLF BROS. & CO. v. HAMILTON-BROWN SHOE CO.

(Circuit Court of Appeals, Eighth Circuit, Nov. 17, 1908. 165 F. R. p. 413.)

1. TRADE-MARKS AND TRADE-NAMES-MARKS SUBJECTS OF OWNERSHIP—DESCRIPTIVE NAMES.

The term "The American Girl," used to designate women's shoes, is a geographical and descriptive, rather than an arbitrary and fanciful name, and is not the subject of a valid trade-mark.

2. TRADE-MARKS AND TRADE-NAMES-MARKS SUBJECTS OF OWNERSHIP—NUMERALS.

Numerals, used to designate particular styles of shoes, rather than the manufacturer, cannot be made the subject of a trade-mark.

3. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION.

A manufacturer, which has adopted a name or device not subject to appropriation as a trade-mark to designate its goods, is still protected in its use from unfair competition.

MAIMEN v. UNION SPECIAL MACH. CO.

(Circuit Court of Appeals, Third Circuit, Nov. 20, 1908. 165 F. R. p. 440.)

1. PATENTS—INVENTION AND INFRINGEMENT—THREAD-CONTROLLING DEVICE FOR SEWING MACHINES.

The Woodward patent, No. 473,461, for a thread-controlling device for sewing machines, was not anticipated, covers a true combination, and discloses patentable invention; also held infringed.

2. PATENTS—SUIT FOR INFRINGEMENT—ACCOUNTING—EFFECT OF FAILURE TO MARK PATENTED ARTICLE.

In a suit in equity for infringement of a patent by a party who failed to mark the articles made thereunder as required by Rev. St. § 4900 (U. S. Comp. St. 1901, p. 3388,) he may nevertheless be decreed an accounting on account of infringement committed by defendant after notice given by the filing of the bill.

BRADLEY v. ECCLES.

(Circuit Court, N. D. New York. Dec. 10, 1908. 165 F. R. p. 447.)

PATENTS—INFRINGEMENT-THILL COUPLING.

The Bradley patent, No. 609,928, for a thill coupling, the essential feature of which is a spherical packing of leather or other similar material interposed between the knuckle and draft-eye, is limited by the prior art to a packing made in a single piece, and is not infringed by one made in separate halves, although pressed into shape and inserted in the coupling before sale.

CHANCE et al. v. GULDEN.

(Circuit Court of Appeals, Third Circuit, Nov. 25, 1908. 165 F. R. p. 624.)

TRADE-MARKS AND TRADE-NAMES — INFRINGEMENT.

The use of the name "Don Cæsar," in connection with the sale of defendants' olives, was not an infringement of complainant's trade-mark, "Don Carlos," used in the same trade.

RICE-STIX DRY GOODS CO. v. J. A. SCRIVEN CO. PREMIUM MFG. CO. v. SAME.

(Circuit Court of Appeals, Eighth Circuit. Nov. 19, 1908. 165 F. R. p. 639.)

TRADE-MARKS AND TRADE-NAMES—COLOR OR PATENTED ARTICLE—EFFECT OF EXPIRATION OF PATENT.

Complainant made and sold men's drawers under a patent which covered the insertion in the seams of a strip of elastic material, such strip as made by complainant being of knitted fabric made of Egyptian yarn, the natural color of which is yellow or buff, while the body of the garment was white. Complainant was not the first to use buff color in combination with white in such garments. Held, that on the expiration of the patent complainant not only ceased to have an monopoly in the elastic strip, but that it had no exclusive right to use the buff-colored material for such strip, whether it was the natural color of the yarn or dyed.

KILBOURN KNITTING MACH. CO. v. LIVERIGHT et al. SAME v. McCONNELL et al.

(Circuit Court of Appeals, Third Circuit, November 24, 1908. 165 F. R. p. 902.)

PATENTS—NOVELTY—OPENWORK STOCKING.

The Blood patent, No. 743,231, for a machine-knit seamless stocking knit from a single thread in one continuous operation, and having lace work down the front of the leg and over the instep, is void, there being no patentable difference between such stocking and the lace front stockings of the prior art, except in the means or method by which it is made and due to the machine.

PLUNGER ELEVATOR CO. v. STANDARD PLUNGER ELEVATOR CO.

(Circuit Court of Appeals, First Circuit. Dec. 4, 1908. 165 F. R. p. 906.)

PATENTS — INFRINGEMENT — HYDRAULIC VALVE MECHANISM.

The Cole patent, No. 700,740, for valve mechanism for hydraulic elevators, designed to permit a quick start of the elevator and secure an automatic slow stop, construed, and held to be of sufficiently primary character to be entitled to a reasonably broad application of the doctrine of equivalents, and, as so construed, infringed by a device in many respects similar to the Larsson patent No. 786,654.

KARFIOL v. ROTHNER et al.

(Circuit Court, E. D New York. Nov. 30, 1908. 165 F. R. p. 923.)

1. PATENTS—VALIDITY AND INFRINGEMENT—PROCESS FOR MAKING LACE PAPER.

The Karfiol patent, No. 835,189, for a process for making lace paper by indenting the paper in the desired pattern and then grinding off the indentations, instead of cutting out the pattern, was not anticipated, and discloses novelty and invention; also held valid as against the defense of prior use and infringed. Patent No. 835,190, to the same patentee, for a multiple machine for practicing such process, held not infringed. Patent No. 835 283, for a single unit or machine, also held infringed.

2. PATENTS—PRIOR USE.

The fact that the method of a process patent had been previously used by another by chance, and without appreciating its merit or value, does not invalidate the patent.

UNDERWOOD TYPEWRITER CO. v. ELLIOTT-FISHER CO.

Circuit Court, S. D. New York. Dec. 21, 1908. 165 F. R. p. 927.)

1. PATENTS—ANTICIPATION—PRIOR PATENT OR PUBLICATION—REQUISITES.

To constitute an anticipation, the prior patent or publication relied upon must, by descriptive words or drawings, or by both, contain and exhibit a substantial representation of the patented improvement in such full, clear, and exact terms as to enable any person skilled in the art to make the article or practice the invention.

2. PATENTS — SUIT FOR INFRINGEMENT—PROOF OF ANTICIPATION.

Anticipation must be proved by evidence so cogent as to leave no reasonable donbt in the mind of the court.

3. PATENTS—INFRINGEMENT — TABULATING ATTACHMENT FOR TYPEWRITERS.

The Gathright patent No. 436,916, for a tabulating attachment for typewriters, held not anticipated, valid, and infringed.

LUDLOW VALVE MFG. CO. v. PITTSBURGH MFG. CO.

(Circuit Court of Appeals, Third Circuit. Nov. 19, 1908. 166 F. R. p. 28.)

1. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—NATURE OF JURISDICTION.

The power of courts of equity to restrain unfair competition is founded on sound business morality.

2. TRADE-MARKS AND TRADE-NAMES—UNLAWFUL COMPETITION—USE OF WORDS.

Courts of equity may require any form of words to be used in connection with an appropriated name, used as a generic description of any article, to completely protect the rightful owner of the name from injury and the public from imposition.

THE FAIR v. DOVER MFG. CO.

(Circuit Court of Appeals, Seventh Circuit. Oct. 6, 1908. 166 F. R. p. 117.)

1. PATENTS—RIGHTS OF PATENTEE—CONTROL OF PRICE OF INVENTION.

The owner of a patent has the right to reserve to himself as a part of his monopoly the control of the price at which dealers may retail the patented product to users.

2. PATENTS—RIGHTS OF PATENTER—CONTROL OF PRICE OF INVENTION.

The sufficiency of the printed notice on a patented article of the reservation by the owner of the patent of the right to fix the retail price at which it may be sold is immaterial in case of a dealer who had actual notice of the reservation and the established price.

YESBERA v. HARDESTY MFG. CO. HARDESTY MFG. CO. v. YESBERA.

(Circuit Court of Appeals, Sixth Circuit. Dec. 23, 1908. 166 F. R. p. 120.)

1. PATENTS — SUITS FOR INFRINGEMENT—PROFITS—EVIDENCE.

Where, on an accounting for profits for infringement of a patent, the defendant fails or refuses to produce his books as ordered by the court, from which the extent of the infringing sales might be ascertained, every doubt should be resolved against him, and the court is justified in acting on less definite and certain evidence. In such case testimony of employes of defendant who are able to state approximately the number of infringing articles made and sold each year during the time of infringement may properly be made the basis of a decree.

2. PATENTS—SUITS FOR INFRINGEMENT—PROFITS—ENTIRE OR PARTIAL PROFITS.

The rule that, where a patent is for an improvement to authorize the recovery of profits from an infringer, the owner must separate or apportion the profits made by defendant between the patented feature and the unpatented features, does not apply to a patent for a combination as a unit in which the parts co-operate.

3. PATENTS—SUITS FOR INFRINGEMENT—DAMAGES—SUFFICIENCY OF EVIDENCE.

Complainant sold articles made under its patent at $2 each, and defendant made and sold infringing articles at $1.70 each. In a suit for infringement the reasonable cost of producing and marketing each article was determined, and the difference between such cost and $1.70 was awarded complainant as profits made by defendant. Held, that it could not be assumed from such facts that but for defendant's infringement complainant could have supplied the same customers at a price exceeding $1.70, so as to entitle it to damages in addition to the profits allowed.

FEDERAL CONST. CO. v. PARK IMPROVEMENT CO.

(Circuit Court, E. D. Wisconsin. December 2, 1908. 166 F. R. p. 128.)

1. PATENTS—INFRINGEMENT-OWNERSHIP OF PATENTED ARTICLE—RIGHT OF USE.

Ownership of a physical structure covered by a patent does not necessarily include the incorporeal right to use the same, nor can such incorporeal right be foreclosed by the operation of state statutes.

2. PATENTS—INFRINGEMENT—CONSENT OF PATENTEE—STRUCTURE BUILT BEFORE APPLICATION.

The inventor of an amusement device, requiring a large building for its inclosure, in partnership with others built such a device and inclosing building in a park with the consent of the lessee of such park, and operated the same for several months before applying for a patent thereon. Snbsequently the existing lease having expired, defendant leased the park, and thns came into possession of the device and building, which had been left attached to the realty. Several months later the inventor was granted a patent on his application. Rev. St. § 4899 (U. S. Comp. St. 1901, p. 3387), provides that "every person who purchases of the inventor * * * or with his knowledge and consent constructs any newly invented machine or other patentable article prior to the application by the inventor * * * for a patent, or who sells or uses one so constructed, shall have the right to nse and vend to others to be used, the specific thing so made or purchased without liability therefor." Held, that defendant was within the protection of such statute, and was not liable for infringement because of its use of the device so in its lawful possession.

DIAMOND STONE-SAWING MACH. CO. OF NEW YORK v. BROWN et al.

(Circuit Court of Appeals, Second Circuit. Dec. 15, 1908. 166 F. R. p. 406.)

1. PATENTS—INFRINGEMENT— MEASURE OF DAMAGES—LICENSE FEE.

In order that a royalty fixed by license contracts may be accepted as a measure of damages against an infringer of a patent who is a stranger to the licenses, it must have been paid or secured before the infringement in snit; and, where that extended both before and after the date of the license contracts, such measure is applicable only to the infringement committed afterward.

2. PATENTS — INFRINGEMENT—"PROFITS"—"DAMAGES."

In patent nomenclature, what the infringer makes is "profits," and what the owner of the patent loses by such infringement is "damages."

LICHTENSTEIN v. STRAUS et al.

(Circuit Court S. D. New York, July 15, 1908. 166 F. R. p. 319.)

1. PATENTS—INFRINGEMENT—PATENTS FOR DESIGNS—DAMAGES.

Under the provision of Act Feb. 4, 1887, c. 105, § 1, 24 Stat. 387 (U. S. Comp. St. 1901, p. 3398), which makes it unlawful to sell or expose for sale any article of manufacture to which a patented design has been applied without the license of the owner, "knowing that the same has been so applied," and provides for any person violating such provision shall be liable in the amount of $250 and for the profits made by him above such amount; to authorize such recovery, where the defendaut was not the manufacturer or person applied such design to the article, it is necessary to prove that he had knowledge of the fact that the design was patented.

2. PATENTS — INFRINGEMENT— DESIGN FOR HATBAND.

The Lichtensten design patent, No. 38,412, for a design for a hatband, held valid and infringed; but the infringers held not liable for the statutory damages of $250 provided for by Act Feb. 4, 1887, c. 105, § 1, 24 Stat. 387 (U. S. Comp. St. 1901, p. 3398,) for selling hats of the patented design thereon, it appearing from the evidence that they had no knowledge of the fact that the design was patented.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Josepb M. Horton, Arcata, Cal. Takedown Chair. Two patents.—The first invention relates to chairs or otber analogous articles of furniture tbat can be readily dismembered so that they will occupy but little space, for storage or transportation, and the principal object is to provide a simple structure of a novel nature that can be readily folded into a compact form, and is easily set up, said chair when in tbe latter position being strong, fully braced, and not liable to accidental collapse.

The second patent relates to a takedown chair, settee or analogous article of furniture, and has for its object to provide such an article whicb can be readily taken apart and set up, said structure when dismembered and packed, occupying but little space, and when set up, being strong, rigid and not liable to become accidentally disconnected.

Louis M. Morrow, and James M. Foster, Portland, Oreg. Winding Machine.–This invention relates to means for winding cloth, lace, ribbon and other material, and the principal object is to provide a novel, very simple, effective and compact machine, which is complete in itself, and is capable of being readily adjusted to holders of different sizes and types, and may be operated by an ordinary electric motor.

George Durst, inventor, deceased; Henry Wood, assignee, Savannah, Ga. Leveling and Plumbing Attachment.—This invention relates to means for leveling, plumbing or ascertaining the inclination of an article, and has for its object to provide an exceedingly simple article of manufacture that can be applied to an ordinary straight edge, square or the like, and will co-operate therewith, when the same is applied to an article, to indicate the position of such article with respect to the perpendicular.

John Benton Hembree, Pelzer, S. C. Vehicle Wheel.—This invention relates to pneumatic tired wheels, and has for its primary object to provide a simple and effective means for securing a pneumatic tire to a wheel without the necessity of employing cement or other adhesive material, such means furthermore positively preventing creeping or longitudinal movement of the tire and thereby obviating the danger of cutting the valve stem.

Abijah M. Dickey. Casper H. Hoag and George A. Dickey, Judsonia, Arkansas. Metallic Cross Tie.—An object of the present invention is to provide a metallic cross tie, equipped with interchangeable track fastening means and having an opening of the proper size and shape, adapted to prevent what is known as "center binding" of the track and to relieve the center of the cross tie of strain. It is also an object of the invention to provide a cross tie, adapted to eliminate the tendency of the cross ties to slip sideways on curves, dumps and similar places, and capable also of withstanding the tendency of tbe track to spring out of line through variations of temperature.

Orbey H. Tolley & John T. Taylor, South Boston, Virginia.—Track Surfacing Level.—The present invention has for its object to provide an efficient instrument, adapted to take the dips out of the track without requiring a civil engineer to set stakes for such operation, and capable of accurately surfacing tracks both on a level and on a grade. Another object of the invention is to provide a track surfacing level, adapted to be used on any percent grade and capable of enabling tbe proper elevation to be given to curves.

William A. Jordan, New Orleans, La., inventor; Oregon W. Long, and William E. Voelkel, Jr., same place, assignees.—An object of this invention is to provide a lock, adapted to be readily applied to a shutter or analogous closure, and capable of enabling the same to be securely locked so that it will be impossible to open the shutter from the exterior without destroying it. Another object of the invention is to provide a shutter lock, equipped with key actuated mechanism and a catch adapted to be locked in engagement with the lug or keeper of a window sill, and capable also of being used independently of the key actuated mechanism when desired.

Gideon S. Adams, Seaville, N. J. Rake.—An object of the present invention is to produce a rake equipped with adjustable rake heads, adapted to be arranged in alinement contiguous to each other to form an ordinary straight rake, or spaced apart to straddle a row of plants, or arranged at an angle to each otber. Another object is to enable the adjustable rake heads to be overlapped to a greater or less extent to vary the size of the rake head, and also bring the teeth closer together.

Frank Baker, Sparta, Ky. Combined Weed Cutter and Cultivator.—This invention has for its object to provide a combined weed cutter and cultivator, designed particularly for use between rows of plants, and adapted to throw a portion of the soil to each side of it contiguous to the plants under cultivation, and which may be easily operated and guided, and is capable of ready adjustment to arrange it to run either deep or shallow.

David B. Baker and John A. Stein, Hoquiam, Wash., inventors; John A. Stein, same place, assignee. Sectional Grate.—An object of tbis invention is to produce a sectional grate in wbich both the grate supporting means and the sections of the grate will be reversible and interchangeable, whereby tbe durability or life of the grate will be materially increased. A further object is to provide a sectional grate in which the various parts of each section will be uniformly heated to cause equal expansion and contraction, and in which the sections will also be maintained at a red heat to prevent accumulation of slag, and to cause all wood pitch and coal tar to be consumed to keep the grate clean. and to maintain a perfect draft, whereby the grate will be prevented from either melting or burning out.

Abba Benton & Charles D. Jordan, Monticello, Ga.—Four patents.—The first patent relates to a planter, designed particularly for planting cotton seed and adapted to open a furrow, drop tbe seed therein and cover the latter. An object of the invention is to provide such a planter, so as to operate effectively on both straight and crooked rows, and equipped with a wheel for actuating the seed-dropping mechanism, said wheel being capable of upward and downward movement witb relation to the planter frame, and adapted to drop into depressions and to ride over stones and clods, whereby the wheel is caused to rotate continuously on all kinds of ground to secure a uniform discharge of seed.

The second patent covers a fender, designed for use on spring tooth cultivators, and capable of a limited upward and downward movement to prevent it from becoming clogged with stones and clods, and adapted to protect young plants and effectually prevent the same from being injured by the soil thrown inwardly by the cultivator teeth.

It is the aim of the invention embraced in the tbird patent to provide a cultivator, equipped with adjustable cultivator teeth, capable of being arranged in a variety of different positions to adapt the implement for use either as a cultivator, harrow or rake.

The fourth patent relates to that class of cultivators employing transverse bars extending laterally from the beam and carrying spring teeth, and its principal object is to improve the pivotal connection between the bars and the teeth so as to avoid perforating the teeth, whereby increased strength, a more rapid assembling of the parts and an easier adjustment of the same are secured.

Benton Boyd, Lemont Furnace, Pa. Larry.—Prior to the present invention the amount of coal delivered to a larry for charging a coke oven has been measured by the eye, and it has been found by experience that cbarges when measured in this manner vary from five to fifteen bushels even with an experienced person, who is always necessary with the present construction of larries. The present invention bas for its object to produce a larry having a measuring device, adapted to measure accurately a charge of coal, and thereby do away with the uncertainty of the present system for filling larries. Also to provide a measuring device capable of adjustment for varying the capacity of the larry and the consequent size of tbe cbarge, and adapted to be readily set for a forty-eight or a seventy-two hour cbarge.

Benjamin F. Bee, Harwichport, Mass. Funnel.—The funnel of the present invention is designed for filling metallic kerosene lamps, and enables the same to be filled without liability of causing an overflow of oil. The funnel is provided witb a clamping device, whicb will yieldably engage the fount or reservoir of a lamp at tbe filling orifice, and which will not interfere with tbe use of the funnel on any lamp.

Curren M. Barekman, Vincennes, Ind. Sorghum Stripper.—It is the aim of the present invention to provide a sorghum stripping machine, which enables the heretofore tedious and expensive operation of removing by hand the blades of the sorghum cane preparatory to extracting the juice therefrom, to be rapidly and effectively performed, without injuring tbe cane. Another object of the invention is to provide means for preventing either the blades from wrapping around the stripping rolls, or the stalks from becoming crusbed between the latter.

John Elder & Charles M. Scoggins, Louisiana, Mo. Wireless Attachment for Check Row Corn Planters.—The principal object of the present invention is to provide a check row attacbment, designed for use on various constructions of corn planters, and adapted to dispense with the use of a wire and the attendant inconvenience of successively anchoring the wire. Another object of the invention is to provide a wireless attachment, which will not require the driver to leave his seat on a corn planter at the end of a row, and which may be instantly thrown out of operation when desired. A further object of the invention is to provide a wireless attachment having marking or walking wheels, and equipped with means for enabling the same to be readily rotated to arrange the marking devices in the desired position with relation to the ground, or to the marks previously made tberein.

Joab Elms, Comanche, Texas. Buggy Top Support.—An object of the present invention is to provide a buggy top support, adapted to be readily applied to the folding top of a buggy or other vehicle, and capable of preventing the same from being broken either when it is being lowered, or while the vehicle is traveling over rough ground. Another object of the invention is to provide a buggy top support, which will not bind or break, and which will relieve the rear bow of jar and vibration to prevent the same from rattling.

William R. Evans, Eagleville, Mo. Combined Shade Roller and Curtain Pole Fixture.—An object of this invention is to provide a curtain fixture, capable of ready adjustment to suit curtains of different widths, and adapted also to form a support for a curtain pole.

Jay Finn, Elmo, Kan. Self-Registering Land Measuring Device.—This invention has for its object to provide a measuring device, capable of automatically recording the distance traveled by it, and of accurately measuring land of any character, without requiring the operator to assume a stooping position while the device is traveling over the ground.

Arthur Gorman, St. Louis, Mo. Self Locking Sash Lock.—It is the aim of this invention to provide a sash lock, adapted to be readily applied to the upper and lower sashes of a window, and capable of automatically locking the same when the sashes are closed. Another object of the invention is to produce a sash lock, which. when applied to a window, will render it impossible to close the sashes without locking the same, and which will effectually prevent a window from being unlocked from the exterior, as by introducing the blade of a knife or other tool between the meeting edges of the sashes.

Ira J. Keeler, Cameron, Mo. Lifting Jack.—An object of this invention is to provide a simple and inexpensive lifting jack adapted for use on all kinds of vehicles, and capable of being readily operated without stooping, or assuming any other cramped position.

Al H. Lamb, Elbon, Pa. Music Leaf Turner.—The present invention has for its object to provide a music leaf turner, adapted to enable a plurality of sheets or leaves to be successfully turned, and capable, when operated, to turn the leaves in either direction, and presenting to the front, in position for operation, a set of finger pieces for moving the leaf-turning means in the opposite direction.

William W. Reid, Winnsboro, Tex., inventor; J. F. Hitt, Winnsboro, Tex., assignee. Sweep Holder for Plows.—The present invention is designed more especially for improving the means for securing a rear sweep to a plow foot or standard, and its principal object is to provide a device capable of adjustment to accommodate different kinds and sizes of rear sweeps, and adapted to effectually prevent the same from turning on the heel bolt, and thereby loosening the tail nut thereof.

William H. Mitchell, Aurora, Neb., inventor; Christian C. Grosshans, Aurora, Neb., assignee. Gate.—The present invention relates to a jump gate, and its principal object is to provide an efficient device for assisting the opening and closing movements of the gate, and for cushioning the latter at the completion of the same, whereby injury to the gate is prevented.

NEW PATENTS FOR SALE.

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FOR SALE—Patent No. 935,255, issued Sept. 28, 1909. Baling Press. Triple stroke with automatic tripping attachment to trip the plunger at any time and withdraw same. Address, P. A. Guenzel, R. F. D., No. 3, Bartlett, Texas. apr

FOR SALE — Patent applied for, Serial No. 532,406. Splice Bar Lock. Does away with all nuts and bolts at rail joints, and avoids drilling two holes in each end of rail. For information address, Edwin S. Shipman, 445 Stokes Ave., Braddock, Pa. apr

FOR SALE—Patents Nos. 916,868, dated March 30, 1909, agricultural implement; Patent No. 911,983, dated Feb. 9, 1909, belt replacer; and 911,876, dated Feb. 9, 1909, cultivator. Inventions also covered by Canadian patents. Will consider proposition for royalty, or will exchange for land and part cash. For further particulars address, John Horinek, Atwood, Kansas. jy

FOR SALE—Patents Nos. 938,538 and 938,539. Railway Ties. Can be laid by one man. Once laid always in proper alignment. Can be manufactured anywhere by anyone. Address, Lewis Wylder, Cathaay, N. Dakota. apr

FOR SALE—Patent No. 934,571, Automatic Dip Tank for all kinds of stock. Stock go under tank and get dip on back, runs all over them. Protects stock from flies and all insect pests. Set in pasture in front of stall. Address, E. M. Reckards, Ozawkie, Kansas. apr

FOR SALE—Patent No. 933,951, dated Sept. 14, 1909. Mailbag Receiving and Delivering Device. Simple and practicable. Nothing like it on the market. Send for terms. Address, Herman H. Behnke, No. 212 West Fifth Street, Davenport, Iowa. mar

FOR SALE—Patent No. 910,950. Concrete Ornamental Lawn Fence. Very attractive. Will sell right or half interest. Pays to market. Full particulars with pleasure. Address, Box 9, St. Jacob, Ill. mar

FOR SALE — Patent No. 913,988. Self Feeder Potato Planting Sack. Price $200. Drops the potatoes directly into the planter from the sack. If interested write me for copy of patent. A. C. Simonis, R. F. D. No. 1, Box 78, Amherst Junction, Wisc. mar

FOR SALE—A valuable patent tool. Spacing instrument, a divider and caliper for the measurement of solid or tubular columns inside and outside. Cheaply manufactured; large profits. An aid to mechanics, designers and other professions. Further particulars will be furnished by Theodore Siragusa, No. 463 Broadway, Paterson, N. J. mar

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FOR SALE—Patent No. 870,949. Trunk-Tray Form. A time and labor-saving device, which means something to the employer. Investigate! Drawings mailed free. Price $2,000. Address, W. S. Gilson, 347 South State Street, Chicago, Ill. mar

FOR SALE—U S. Patent No. 927,356. Also Canada and Great Britain patent rights. Wonderful heating drum: throws all the heat down: absolutely no odors; burns half the gas of any stove of its size known. Will sell one or all three patents. For description, illustration, etc. Address, Dr. W. S. Keyser, Everett, Wash. feb

FOR SALE—Patent No. 917,951. Bit. Calf, colt, cow weaner. Will sell rights. The present invention inserted in the mouth of the animal suffering with bloat will save it from dying. Address, J. C. Krause, Bessie, Okla. feb

FOR SALE—Patent No. 915,003, issued March 9, 1909. The Whisler automatic screwdriver: the best on earth. Address, Box 364, Burlington, Kansas. feb

FOR SALE—U. S. Patent No. 889,151, granted May 26, 1608. Street Car Fender. Has telescoping section to save persons struck by moving car. Address, H. M. Prater, Box 27, Crocker, Missouri. feb

FOR SALE—Patent No. 856,018. Power Shovel. Price $1000. Patent No. 917,525, Safety Appliance for R. R. Cars, $4000. For further information write to R. Belden, Pulga, Cal. feb

FOR SALE—Patent No. 924,392, issued June 8, 1909. This invention is a weeding attachment for any cultivator. Will sell outright or fifteen per cent on royalty. Good for potatoes, hops, corn, etc. Address, J. J. Smith, Banks, Oregon. feb

FOR SALE—U. S. Patent, No. 630,598, issued August 10, 1909. Sash Fastener. Something simple, cheap to manufacture, useful and convenient. Should be welcomed as an assurance of safety in every home. Address, Robert Henry, Blue Lake, Humboldt County, Cal. feb

FOR SALE—Patent No. 923,820. Metallic Cross Tie. Patented June 8, 1909. For information address, G. A. & A. M. Dickey & C. H. Hoag, Judsonia, Arkansas. feb

FOR SALE outright or on royalty—Patent for Safety Stop for Cars. For further information apply or write to William Gunter, Federal Hill, Frostburg, Maryland. feb

FOR SALE—Patent No. 918,730, dated April 20, 1909. Door Opener. A device for opening doors with the foot. Can be attached to any door having a common lock. A useful article and should have an extensive sale. Want correspondence with honest men or manufacturers to place door opener on the market. Will sell outright or part interest at reasonable price. Address, K. I. Bronson, R. R. No. 1, Rice Lake, Wisc. feb

FOR SALE—Improved Syphon Cream Separator and Milk Skimmer for household milk bottles. Address, William Kolvig, No. 54 Beacon Street, Quincy, Mass. feb

FOR SALE—Patent No. 926,856. Combined Belt Slide Button and Drawers Supporter, dated July 6, 1909. Will sell outright or place on royalty plan with reliable firm. Address, Arthur C. Davis, Mulberry, Florida. feb

FOR SALE—Patent No. 930,903. Irrigation ditch outlet or floating water gauge. Avoids difficulties due to irregularity of flow. A great labor saver. Good for either a company or private users of water, as it allows a fair distribution. Address, William H. Tucker, Vernon, B. C., Canada. feb

FOR SALE—Patent No. 932,269. Smoking pipe for automobilists. Tobacco or ashes do not blow out while riding in a fast motor. No wind, rain or air pressure can get into pipe. Will be a big money-maker. Address, Albert Gloede, Suffern, N. Y. feb

FOR SALE—Patent No. 899,489, dated Sept. 22, 1908. Pick Ax Guard. A device that is much needed in rock work and coal mines. Saves the handle from wearing out and keeps it solid in eye of pick. A simple working device. Cannot be a better one invented. Would like to hear from any one who buys patents. Address, T. W. Gordon, East Franklin, Maine. feb '10

FOR SALE—Patent No. 620,239, issued May 4, 1909. Mail Receiver and Deliverer. Will sell outright at a reasonable price. For particulars, address Joseph O. Anderson, Bercail, Mont. mar '10

FOR SALE—Patent No. 924,514, dated June 8, 1909. This is a great money saving device for railroads. No more batted joints. Will greatly increase the life of rails. Will sell outright or on royalty basis. Address, John Warchock, Box 43, Seney, Mich. feb '10

FOR SALE on royalty, my wrench—U. S. Patent No. 632,951, Aug. 31, 1909. No screws, springs, or teeth to play out. Strongest, cheapest, and handiest wrench on the market. Address, A. R. Bell, Evesham Via Macklin, Sask., Canada. mar

FOR SALE—Patent No. 937,299, issued October 19, 1909. Derrick bracing means. The real anchor discovered at last. To prevent the wind storms from destroying oil derricks and wind mills. Address, Frank E. Foster, Sapulpa, Oklahoma. mar

FOR SALE—Patent No. 927,208, dated July 6, 1909. Will sell broom hanger with two improvements. United States, $800; also invention in Canada for $800. Will take one cent on royalty, sell outright, or strictly honest partner. I have other inventions. Address, James H. Ashmead, Lake George, N. Y. mar

WANTED.

WANTED—Financial assistance in protecting and exploiting five inventions having originality and merit which will commend them to the countries of the world. Liberal interest will be given in the patents to be procured in exchange for the capital necessary for the making of models, incidental and other expenses. For full particulars address, John Horinek, Atwood, Kansas. jy

WANTED—A company to buy or manufacture on royalty patent No. 782,600. A holder to make teneriffe lace work on. Does away with loose pins and outside catches. Address, Mrs. R. E. Dexter, Fayville, Illinois. feb

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WASHINGTON, D. C., FEBRUARY 1, 1910.

State Laws Concerning Patents.

The right of a state or municipality to place restrictions by laws and ordinances upon the manner in which patents should be assigned or sold, has recently been brought squarely before the United States Supreme Court, with the result that it has been confirmed. The history of the litigation on this moot question, is interesting:

The State of Kansas passed a law providing:

"Sec. 1. It shall be unlawful for any person to sell or barter or to offer to sell or barter, any patent right or any right which said person shall allege to be a patent right, in any county within this State, without first filing with the clerk of the district court of such county copies of the letters patent, duly authenticated, and at the same time swearing or affirming to an affidavit before such clerk that such letters patent are genuine and have not been revoked or annulled, and that he has full authority to sell or barter the right so patented; which affidavit shall also set forth his name, age, occupation and residence; and if an agent, the name, occupation and residence of his principal. A copy of this affidavit shall be filed in the office of said clerk, and said clerk shall give a copy of said affidavit to the applicant, who shall exhibit the same to any person on demand.

Sec. 2. Any person who may take any obligation in writing for which any patent right, or right claimed by him or her to be a patent right, shall form a whole or any part of the consideration, shall, before it is signed by the maker or makers, insert in the body of said written obligation, above the signature of said maker or makers, in legible writing or print, the words 'Given for a patent right.'

Sec. 3. Any person who shall sell or barter, or offer to sell or barter, within this state, or shall take any obligation or promise in writing for a patent right, or for what he may call a patent right, without complying with the requirements of this act, or shall refuse to exhibit the certificate when demanded, shall be deemed guilty of a misdemeanor and on conviction thereof before any court of competent jurisdiction shall be fined in any sum not exceeding $1,000, or be imprisoned in the jail of the proper county not more than six months, and at the discretion of the court or jury trying the same, and shall be liable to the party injured in a civil action for any damages sustained."

Various States in the Union had also passed similar laws, but the question of their validity had never been decided by any higher tribunal than the State courts. Naturally such laws were resisted, for to require a patentee to file a certified copy of his letters patent in the office of the county clerk and at the same time to make an affidavit before the clerk as to the genuineness of the patent, before offering to sell patent rights, amounted to a serious tax upon the operation of selling territory under a patent.

The well known method of making such sales—which was in vogue to a greater extent 20 years ago than it is now—provoked just criticism, and in many instances no doubt involved fraud. A man who desired to sell county rights of a gate, say, would go to a town and set up his model—sometimes a full sized one—in front of the hotel where he was stopping. The practical illustration of its working would always attract interested observers, and the seller would presently find some one willing to put money into it. But there was no proof that the man had any authority whatever to dispose of the patent rights of the gate; he might be the owner, or he might not, as would transpire subsequently, months after he had departed with his collection. The requirement that certified copies of the patent be filed, as above described, cures this abuse. On the other hand, it costs upwards of $2. to file such copy and to make affidavit, and this, when it has to be repeated in each county seat, amounts, as we have just said, to a somewhat onerous tax upon the owner of the patent.

Those who have contended for the invalidity of the statute in question insist that it violates Art. 1, Sec. 8 of the United States Constitution, which grants to Congress the right to promote the progress of science and the useful arts by securing, for a limited time, to authors and inventors the exclusive right to their writings and discoveries; and since the right to sell or assign the whole or any part of a patent is derived from the laws of Congress, any regulation whatsoever by any state authority in regard to such sale or assignment is illegal. The matter was carried to the State Court of Kansas, which upheld and maintained the act on the ground that the statute was simply a reasonable and proper exercise of the police powers of a State; that its provisions did not trench upon the Federal power or interfere with the rights secured to patentees by Federal laws, and that it was in the nature of a police regulation designed for the protection of the people against imposition and fraud.

In Indiana, Ohio, Pennsylvania, New York, Arkansas and Tennessee, the validity of similar statutes has been upheld, while the courts of Illinois, Michigan, Nebraska and Wisconsin have declared the same void. In the Michigan court, (Cranston vs. Smith) Judge Campbell said: "While we cannot but recognize the magnitude of an evil which has brought patents into popular discredit and has provoked legislation in several States similar to that of Michigan, we cannot on the other hand fail to see in this law a plain and clear purpose to check the evil by hindering parties owing patents from dealing with them as they may deal with their other possessions." With this wide difference of opinion among the State courts, there was considerable uncertainty as to how the Supreme Court would view the matter. While the court had said in Weber vs. Virginia that "Congress never intended that the patent laws should displace the police powers of the States"—meaning by that term those powers by which the health, good order, peace and general welfare of the community are promoted—the subject then under consideration was the regulation of the tangible property covered by a patent; and it was thought that the patent would not exclude from the operation of the taxing law of the state the tangible property manufactured under the same. Many believed, however, that the position of the court of Michigan would be followed by the United States Supreme Court. The Kansas case having been appealed to the latter, and a decision having been rendered, it is no longer a matter of speculation. The court has upheld the Kansas law. The question is settled finally. Referring to the difficulty of complying with the law, the court said: "We do not see why a state may not in the bona fida exercise of its powers, enact some special statutory provisions which may tend to arrest the evil. The expense of filing copy of patent and the making of affidavits in the various counties of the state in which the owner of the rights desires to deal with them, is not so great, in our judgment, as to be regarded as oppressive or unreasonable, and we fail to find any other part of the act which may be so regarded."

Patentees should therefore, in selling territory in the states named, or in any other state in which similar laws are in force, take care to comply with the provisions of the statutes. Indeed before starting to sell territory in any state, a patentee should if possible ascertain just what the laws prescribe on this question.

As to the property protected by a patent, whether it be an article or a machine or a composition of matter, it has also been determined by the same high authority that the use of such property is subject to the control of the several states, to the same extent as any other species of property. The Supreme Court held: "Under certain circumstances, the sale of patented articles may be controlled within the several states by a legitimate exercise of their powers over their various domestic affairs, whether of internal commerce or police regulation, and this is not an interference with the right conferred by the patent."

It has therefore been decided, not only that States have the right to tax the sale of articles or even control their use, if deleterious to health or otherwise affecting the peace and happiness of the community; but that the practise of disposing of territory under patents must be exercised with due regard to the laws of the several states, and that the selling of "blue sky," as it has sometimes been called, can no longer be effected with the same ease and lack of restriction as formerly. Naturally, such laws are bound to interfere with the operations of patents, but it is true in this case as in every other, that such rights must give way to the superior claims of the public, when fraud is possible.

The decision is not the one for which we had hoped, but it is at least gratifying to feel that a question which has occasioned much legal comment and difference of opinion, and has given rise to complaints on the part of many patentees, has been definitely settled for all time.

SCIENTIFIC PROGRESS.

Compressed Air vs. The Whisk Broom.

And now we are to have our clothes, as well as our houses, cleaned by compressed air. The vacuum cleaner, which has long been used in railway cars for the removal of dust, is to be applied to travelers. When the Pullman porter approaches us expectantly at the end of a journey, he will carry not the familiar whisk, but a device with hose attachment, which instead of scattering clouds of dust and germs upon our fellow pilgrims, will draw them all promptly and scientifically into a box, there to be rendered harmless.

Filtering Air.

To sterilize the air we breathe is one of the most recent achievements of science. A member of the French Academy of medicine has devised a method of purifying the atmosphere in rooms, which promises to be hygenically valuable. He has invented an air filter, the principle of which is based on the method adopted by certain physiologists for determining the number of germs contained in the air. This filter consists of a small ventilator worked by electricity, which displaces about 200 cubic meters of air an hour. Beneath the fans of the ventilator is a reservoir of glycerine. The rotation of the fans scatters the glycerine in very fine drops along the walls of the cylinder containing the ventilator, and the 200 cubic meters of air which are passing through the cylinder are purified, since the air particles constantly come into contact with the little circle of liquid particles, which carry with them as they fall the germ, dust, microbes and spores always found in the air.

The mechanical sterilization of air by this method is a kind of laboratory imitation of the wholesale purification accomplished by nature by means of a heavy rain fall. The general use of this apparatus, it is believed, would greatly diminish the risks of contagion by germs of scarlatina, small pox and tuberculosis.

New Paper Money.

The slang term "velvet" applied to money may become a properly descriptive expression, if experiments now being made by Treasury officials turn out to be successful. Instead of being crisp, the money to be produced by the government Bureau of Engraving and Printing will then be soft and velvety. These experiments are being made for the purpose of demonstrating the advantages of such paper. By the new process, it will take 60 days less to manufacture a bank note than by the present method. The chemical solution employed not only renders the money soft and pliable, but also makes it non-shrinkable. The solution acts as an antiseptic and conservative. When applied to old documents, it seems to knit the fiber together and prevent further decay. By the process of printing paper money now in use the paper has to be thoroughly soaked in water. While it is in this soaked condition, one side of the paper is printed. The sheet is then placed in a steam room and kept under high temperature for 30 days, the time necessary for the ink to dry. The sheet is again soaked, as in the first instance, and the reverse side of the bill printed. The 30 days drying process then has to be repeated. In cases where a third impression on a bill is necessary, when the printing is done in two colors, the wetting is again repeated, and another month must be consumed. Besides the delay of this process, the wetting and drying rot the fiber of the paper; and although it is starched to give it a crisp appearance, starch soon wears out, and the bill becomes limp and unsatisfactory. In printing bills on paper that has been treated by the new process, no wetting is necessary. The ink loses none of its luster when applied to the paper, as in the old method, and is thoroughly dry within 48 hours after the printing is done.

Drinking Glasses Made of Ice.

It has long been usual to place ice in a beverage to be cooled, but it has remained for a Dutch inventor to invert this idea and put the drink in ice. The first factory of ice drinking cups which was a practical and financial success was erected in the summer of 1908, in Scheveningen, a popular resort near the Hague, Holland. The ice beaker, as it is called, consists of a receptacle of ice which, for more convenient handling, is enclosed in a protecting envelope of paper. The beaker may be made in all degrees of transparency, from that of glass to porcelain white, or may even be colored. The wall of the vessel is 1-10 of an inch thick at the upper edge and somewhat thicker at the bottom. The weight is in the neighborhood of three-fifths of an ounce, and it holds about one half pint. Capacity and insulation are so adjusted that it melts regularly and slowly. When filled at summer temperature, it will stand for about one half hour. It is intended to be used only once, which assures to every customer his own beaker. For this reason it may be regarded as being strictly hygienic.

The use of such a drinking vessel with carbonated liquids, says *Pure Products*, is advantageous in that the ice retards the evolution of gas, so that the beverage is not only kept cool, but is prevented from becoming flat. The cost of manufacturing the beaker amounts to about a quarter of a cent, three-fourths of which is for the paper hull. This protective covering may be of any suitable insulating material, but paper is found the most convenient. These hulls are particularly suitable for advertising, and when so used—as there is not the least doubt they will be—may be made a source of revenue to the cool-drink dealer.

Machines for making these cups are on the market. The refrigeration is effected by means of a sulphur dioxide refrigerating machine. The capacity of the apparatus is 100 beakers per hour, the power required being one horsepower. These beakers are naturally designed to hold, not warm liquids, but liquids which have been previously cooled. This is a novelty which is likely to obtain considerable vogue.

Pictures by Wire.

As soon as it became possible to hear sounds at long distances, over the wire, the question arose, why should not vision be transmitted in the same way? This seemed for years impossible of achievement, but science is about to make it appear as little of a marvel as the telephone. Early efforts in this direction involved the transmission of photographs by telegraphy, and an extension of the method would transmit actual images. The chief trouble has been that the elements of the picture must be reproduced in succession, and while this makes no difference with a photograph, it is a vital objection with an image that is to be taken in by the eye all at once. The successive reproduction of the thousands of minute points making up the whole would have to take place in the fraction of a second—so quickly that the first would be still affecting the retina when the last was flashed upon it. Now we are told, says the *Literary Digest*, that a German inventor has succeeded in overcoming all difficulties, and that an electric "far-seer" costing a million and a quarter dollars, is to be shown in operation at the Brussels Exposition next summer. The theory of the machine is plausible. The expense of such an apparatus, as well as the sluggishness or inertia of the photo-electric selenium cells, have been in the past among the drawbacks to a practical realization of the idea. The device which it is proposed to exhibit at Brussels has cost upwards of a million dollars. The demonstration apparatus has been produced, however, at a cost of $1,000, and owing to its more elementary construction lends itself only to the reproduction of simple patterns, consisting of squares arranged in different combinations. A projection apparatus throws the pattern on a screen hung upon the wall, which screen consists of a square divided into 25 square sections. Behind each of these is arranged a highly sensitive selenium cell in which, by a novel process, inertia has been absolutely eliminated. It thus responds instantaneously to any variation in lighting it is exposed to. At the receiving station is arranged a similar screen, divided into the same number of sections, each of which communicates with the corresponding section on the transmitting screen. A highly sensitive mirror galvanometer reconverts the fluctuations of current produced by fluctuations in luminous intensity on the transmitting screen, into corresponding light variations. A battery supplies current to the tele-vision circuits.

As soon as a perforated pattern is inserted into the projector, a telegraphic reproduction of the picture is seen to appear at the very moment it is thrown on the transmitting screen. The sluggishness of the cells has been compensated to such a degree that the telegraphic picture will respond practically instantaneously to any motion. In fact, a reproduction obtained at best in a few minutes with the aid of the photo-telegraphic apparatus so far constructed, is here achieved in a fraction of a second, so that several phases of a motion can be reproduced within a second.

The apparatus, as described, is simple, but an enormous amount of labor had to be expended in constructing it. Each section, with its selenium cell and mirror galvanometer device, is an apparatus of precision in itself, while the entire device is composed of 10,000 elements of the same kind. Each cell is wound personally by the inventor, who never entrusts this work to anyone else.

Making Gold.

Is the dream of the alchemist about to be realized? The transmutation of metals has for centuries been the object of a quest as eager and with as much apparent hope of success, as the search for the fountain of youth. An inventor and engineer of standing in the scientific world, however, believes that he is on the track of this discovery. Less attention might be paid to his claims, were it not for the fact that he has demonstrated his practical ability in the electrical field. R. M. Hunter, of Pennsylvania, has taken out hundreds of patents on devices connected with trolleys, conduit and accumulator systems of traction. He has now turned his attention to the transmutation of metals. It is generally accepted by science, he says, that all metals are composed of one primary substance; and that whether the metal is gold, silver or copper depends upon only the grouping and electron condition of the primary particles of ions. An atom of silver, for instance, is composed of thousands of little particles which move about with the rapidity of lightning, like planets in orbits, but at no time leave their range. If these particles were de-electrified, so that they were deprived of polarity and inductional capacity and set in motion in a new orbital range by means of the proper electrical charge, another metal would be the result. This is nature's process of transmutation. In the course of centuries, she changes silver into gold. Metals of lower atomic weight are all positively transformable into metals of higher weight. Gold differs from silver in having a higher atomic weight; or in other words, its atom has nearly twice as many primary particles of ions. The latter are differently grouped, and the crystallization, polarization and specific gravity are also different. But the inventor claims that he has discovered the method of effecting this change, and he is now building a plant where gold will be turned out fastener than it is at the mint. We cannot afford, in this age, to have little faith. It was but a few years ago that the flying machine was hooted as the acme of folly, and the little that has been learned of radium has staggered skepticism. Still, the world will wait to see the new process in operation before it changes its standard of value.

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Humidifier....S. H. Bunnell
Husking-machine....W. Clouser
Hydrocarbon-burning furnace, Metal-melting....G. W. McKee
Ice-cream machinery....R. R. Row
Indicating and recording device....J. T. Whalen
Indicating and recording device....F. A. Morgan
Inductive disturbances, Nullifying..W. E. Athearn
Inductive disturbances, System for nullifying....J. A. Barrett
Infusions, Apparatus for preparing..F. A. Cauchois
Ingot....R. B. Carnahan, Jr.
Inkstand....H. R. Christians
Insole-reinforcing machine....W. H. Hooper
Insulators, Manufacturing....L. McCarthy
Internal-combustion engine....R. L. Frost
Iron manufacture....R. B. Carnahan, Jr.
Iron or steel, Treating....F. M. Becket
Ironing-press....W. Bartholomew
Knife for tapping rubber-trees....Q. O. Bradford
Knitting-machine take-up mechanism..G.L.Ballard
Knitting-machines, Needle-cam for straight independent-needle....B. Popp
Knockdown box....L. Weglein, Jr.
Lebeling-machine....E. F. Rorke
Labeling-machine....F. O. Woodland
Labeling machine, Box-....F. Coates
Lamp-burner....S. B. Morss
Lamp-burner....F. E. Fender
Lamp for dental, medical, or surgical purposes, Aseptic....D. Stern
Lamp socket, Incandescent-....F. W. Slady
Lamp, Vehicle-....F. C. Ahrens
Last jack, Boot and shoe....T. G. Plant
Leather-edging tool....F. F. Cumms
Lens-polishing machine....C. E. Quimby
Lens system....M. von Rohr
Lenses, Machine for grinding the surfaces of....E. M. Long
Level....T. H. Brittain
Lightning-rods, Water retaining and conveying attachment for cable....H. Simpson
Liquid-fuel burner....A. Koch
Liquid-volume recorder, 2 patents....C. I. Carrico and B. Hawkins
Lock....J. Hernicz
Loom for making tufted fabrics....F. A. Whitmore
Loom-temple....N. I. Allen
Loom, Weft-replenishing..H. Wyman and J. T. Cyr
Looms, Web-cutting mechanism for cane-..J. Tilp
Lungs, Apparatus for developing the....V. J. Schaeffer et al
Mail-bag catcher and deliverer....W. H., A. P., and A. Moore
Mail-package....B. L. Dotson
Match-machines, Dipping device for....O. H. Landvatter
Measure, Tape....T. W. Hanrath
Measurer and marker, Cloth....C. J. Sykes
Measuring device....J. Hood
Meat-conveyer....W. A. Guenther
Meat-hanger....M. J. Condell et al
Mechanical movement....C. A. Tower
Mechanical movement....G. A. Anderson
Metal sheets, Machine for shearing....G. B. Johnson
Metal wheel....J. W. Murray
Metal-working machine....B. M. W. Hanson
Metals, Apparatus for treating molten....F. S. Adams
Metallic tie and rail-fastener....G. A. Hassel
Metallic tie and rail-fastening....G. A. Hassel
Milk-can....G. H. & E. G. Damrow
Milking-machine....J. J. Bukolt
Milling, facing, and other metal-cutting operations, Machine for....W. A. & F. Pearn
Mine-door-operating device....J. M. Sausser
Mixing apparatus....D. B. Jackson
Mixing-machine....W. McRae
Molasses-jug and other hinged-lid receptacle....C. S. Baron
Molding appaaatus....J. D. Sullivan
Molding-machine....E. H. Van Natta
Motive-power system....A. Wilstam
Mower, Lawn....A. B. Case
Mower, Power lawn....W. P. M. Braun
Mud-guard....W. J. Chisholm
Necktie....J. A. Soderstrom
Needle, Lacing....W. T. Germany
Nozzle-support and spraying device, Combination....E. Sutherland
Nut-lock....G. L. Smith et al
Nut-lock....C. F. Sawyer
Oil-burner....W. Sutton
Oil burner, Crude....E. L. Newman
Oil burner, Crude....2 pats..F. D. Stalford
Optical instrument....F. L. G. Kollmorgen
Optical cystoscope system....M. von Rohr
Orchard-heating device....J. L. Hamilton
Ore-concentrator....C. L. McKesson et al
Ores, Treating....J. R. Parks
Padlock, Combination....D. L. Campbell
Padlock, Permutation..2 pats....J. T. Whalen
Paper....P. Hinkel
Paper, &c., Apparatus for cutting....P. G. E. Daniel et al
Paper box....3 pats....C. S. Bird
Paper-making machine....J. H. Wallace
Paper receptacles, Machine for making....C. Marthinson
Paste pot or jar....C. A. Schmitt
Peat-condensing machine....W. L. Shepard
Pen, Self-filling fountain....J. A. Vogelmann
Penholder attachment....J. J. Fitzgerald
Pencil....W. A. Fraser
Pencil-holder....W. E. Philo
Percolator, Coffee....G. E. Mittinger, Jr
Percolator, Syrup....F. De Clereq
Permutation-lock....J. E. Le Myre
Phase adjustment....W. E. Sumpner
Photographic shutter....C. F. J. Niss
Piano-bench....A. B. Hanson
Picture-frame-making machine....J. Mueller
Pictures, pieces of music, and other performances, Apparatus for producing audible moving....F. E. Thormeyer
Pie-trimmer....A. J. Perron
Pincers, Lasting....W. Huck
Pipe....J. A. Irving
Pipe....L. Morris
Pipe-coupling, Automatie....F. C. Doane et al
Pipes, &c., Coupling for train....J. E. Forsyth
Pipes, Flauging....C. D. Murdock
Plate attachment, Pie....H. Isaacs
Plate, Making half-tone....J. Hartnett, Jr
Pliers, Wire-skinning....G. W. Goodridge
Plow....B. T. Bethune
Plow, Motor....W. T. Bennett
Plows, Weed-turning attachment for....T. J. Baxter
Plumbing-trap....J. T. Costello
Plunger head or valve....J. E. Shutt
Pneumatic sweeper....S. Markstein
Potato-cutter....J. A. Wise
Potato-vine cutter....G. P. Gregory
Power-controller for machines..H. S. Wilcox et al
Power-transmission apparatus....D. E. Selders
Power-transmission mechanism....C. Kilroy
Power-transmitting apparatus...R. A. La Pointe
Power-transmitting mechanism....C. H. Draper
Preserving edible substances....A. J. Baldwin
Press....J. C. Fiddyment
Pressure generating, controlling, and applying device, Hydraulic....J. W. Nelson
Pressure-regulator....W. F. Kirchbaum
Printer's galley....J. L. Lee
Printing-machine....W. L. Sloane et al
Printing-press....A. J. Mottlau
Propeller....O. P. Smith
Pulley, Split-metal....E. Philips
Pulp-screening machine....J. F. Fisher
Pump....2 pats....N. McCarty
Pump....W. T. McLean et al
Pump, Automatic air....E. Reed
Pump, Multiple-impeller....A. E. Guy
Pump, Vacuum....G. H. Zschech
Rack for rolls of merchandise....C. J. Simonson
Rail connection....W. C. Bopp
Rail-curve seat....J. E. Dougherty
Rail-fastener....F. Persic
Rail fastener and bond....C. D. McAfee
Rail-fastening device....H. M. Mason et al
Rail-joint....G. H. Barbour
Rail-joint....J. Schushey
Rail-joint, Insulated....G. W. Whiteman
Rail-tie....C. Carrell
Rails, &c., Instrument for measuring the cross-section of....R. Barthelmes
Rail, Treatment of steel....F. H. Daniels
Railway automatic safety appliance....W. G. Daring
Railway, Cable....G. F. Roughan
Railway-crossing gate, Automatically-operated..W. J. Cook
Railway-frog....2 pats....H. G. Elfborg
Railway-rail structure....E. S. Nethercut
Railway-rail tie and brace....H. O. Wert
Railway safety appliance....J. T. Andrew
Railway-signal....L. E. Garnett
Railway signaling apparatus....W. J. Cook
Railway slgnaling system....T. M. Dougal et al
Railway-switch....D. C. McCalib
Railway-switch....G. D. Worley
Railway system, Third-rail electric...C. Kozesnik
Railway-tie....F. Schumann
Range-finder, Single-observer....A Barr et al
Ratchet-releasing mechanism....C. O. L. Cardell
Razor, Safety....F. Cupelli
Refrigerator....J. H. Manon
Reinforced fabric, Unwoven..E. D. C. Bayne et al
Repair device, Adhesive....W. N. Shelton
Reversing mechanism....J. C. Ross
Ribbon-feed mechanism....C. M. Crook
Rim holder, Spare....B. B. Bradley
Road construction and repair....S. G. Howe
Rock-drill....H. J. Hibschle
Roundabout, Vertical....W. A. Sullivan
Sad-iron, Electrical....W. A. Braun
Saggar....W. E. Rivers
Sand-ramming machine....H. P. Macdonald
Sash-lock....O. Pearson et al
Sash-lock....G. M. Blandford
Sash-operating mechanism....S. E. Cibulas
Saw, Drag....F. Hernquist
Saw-hanger....L. D. Reece
Saw swaging and shaping device....T. W. Cross
Scale....C. M. Sturgis
Scale, Platform....M. H. Winslow
Scraper....H. Bingaman et al
Screen-holding device, Wire....W. A. Smitson
Self-cleaning rake....F. W. Wieman
Sewing and embroidering machine...R. Cornely
Sewing-machine....T. C. Plant
Sewing-machine channel-moistening device....W. H. Hooper
Sewing-machine channeling device....T. G. Plant
Sewing-machine, Lock-stitch....T. G. Plant
Sewing-machine, Shoe....T. G. Plant
Shaft....G. R. Moore
Sharpener, Scraper....J. B. Ackermann
Shaving mug and brush casing....O. Liles
Sheet-metal bodies, Apparatus for forming hollow....B. Adriance et al
Shingle-bracket....J. B. Demary
Shipping case or box, Knockdown..W. H. Doble
Shoe....F. A. Critz, Jr
Shoe-polishing machine....F. Humphreville
Shoe-rack....S. Herman
Shoulder-brace....J. U. Adams
Shoveling-machine....3 pats....W. Whaley
Sign....R. J. Lackner
Sign, Illuminated....F. Ward
Signal....L. A. Hawkins
Signal and air-brake, Combined....A. M. Jones
Silicon carbid, Producing....F. J. Tone
Skins and the like, Machine for the treatment of....F. A. Geipel
Slicing-machine....S. L. Garner
Snap-hook, Swivel....W. A. Schleicher
Snow-shovel....G. C. Port
Soap for washing, cleaning, and bleaching purposes, Substitute for....P. Mausolff
Soda-fountains, Syrup-pump for...H. L. Snediker
Soldering-machine....W. M. Holloway
Soldering-tool, Automatic....B. F. White
Sorting-machine....A. Picken
Sound-box for sound recording and reproducing machines....J. C. English
Sound, Recording....G. K. Cheney
Sound-box for sound recording and reproducing machines....J. C. English
Sound-recording apparatus....G. K. Cheney
Sower, Seed....S. A. Plummer
Spades or other tools, Means for attaching shafts to....E. C. M. W. Stjernstedt
Spark-arrester....L. A. Coleman
Spark-plug....C. A. Martin
Speed-controller, Automatic....W. A. Loomis
Speedometer....H. C. Berry
Spindle-bands, Tension-regulating device for....J. S. Berard
Spring-wheel....A. R. Miskin
Springs, Machine for making coiled....F. H. Sleepor
Sprinkler-system alarm....M. G. Young
Square....S. B. & O. J. Easley
Squeezer....W. M. Holloway
Stacker, Hay....E. Barnes
Stacker, Hay....F. M. Erwin
Starch, Soluble....A. E. Militz
Steam or other fluid pressure regulator....W. H. O'Connor
Steam-washer, Automatic....R. E. Jaek
Stocking, Self-supporting....G. Graham
Stopper....O. A. Borden
Stove....J. M. Johnson et al
Stove and range top, Cooking....B. B. Culver
Stove frame, Gas....F. Graff Jr
Stovepipe....W. W. Graham
Street-indicator and advertising device, Combined....J. H. Goodier
Sweep-stock....J. Stone
Swimming applianee....W. A. Glazier
Swing....E. V. Lewis
Talking-machine sound-box....J. C. English
Talking-machine stand and horn, Combined....H. C. Miller
Talking-machines, Apparatus for making sound-records for....C. S. Wickes
Teaching penmanship, Device for...S. R. Smith
Telephone attachment....C. B. Mitchell
Telephone-cabinet....C. E. Oxford
Telephone-key and means for actuating the same....W. Christensen
Telephone-mouthpiece, Antiseptie...G, Rowlands
Telephone system....D. S. Hulfish
Telephone system....H. B. Stone
Telephone system....J. N. Wallace
Telephonic system for auditoriums....K. M. Turner
Thorium sulifid, Making....I. L. Huber
Threshing-machine concave....O. H. Paschke
Tile-faced blocks, Machine for molding....W. P. Meeker et al
Tin-plate by means of chlorin, Detinning....H. von Schultz
Tin-plate-finishing machine....E. Norton
Tire....A. Tizard
Tire, Cushion....C. O. Baughman
Tire for vehicles, Resilient....G. O. Draper
Tire protector, Rubber....H. R. Palmer
Tire, Spring....R. M. Spencer
Tire, Wheel....F. L. Berg
Tobacco-press....C. H. Hammond
Tongue-support....W. C. D. Evans
Tool-holder....W. J. Powell
Tool-holder and means for setting the tools therein....M. Morton
Torpedo....J. Tasto
Toy....A. H. Cotton
Track structure....C. W. Kutz
Trap....C. Janke
Trap....W. W. Worcester
Traveling-bag hinge....W. J. Petri
Treadle mechanism....W. Bartholomew
Trick-chair....E. D. Moulin
Trolley-pole casclier....J. H. Walker
Trolley, Self-restoring....H. H. Parker
Trousers-crease retainer....H. A. Neumann
Truck, Car....W. H. Son
Truck, Car....C. W. Wodznski
Truck side frames, Brake-hanger-pin construetion for car....G. G. Ployd
Tubes, Apparatus for making spirally-wound....C. F. Jenkins
Tug attachment, Shaft....A. Littmann et al
Turbine, Elastic-fluid....J. S. Green
Turbine, Elastic-fluid....P. J. Hedlund
Turbine, Steam....M. Keller
Turbines, Automatic stop for elastic-fluid....F. Hodgkinson
Typewriter, Key-wheel....J. W. Miller, Sr
Typewriting machine....H. R. White
Typewriting machine....O. Woodward
Typewriting machine....C. B. Yaw
Typewriting machine....J. C. McLaughlin
Typewriting-machine adjusting appliance....C, S. Alverson
Undertaker's lifting-strap....J. P. Huber
Union suit....reissue....J. E. Richards
Unloading deviee, Shiftable instantaneous....J. Herks
Urinal, Female....M. M. Van Vechten
Valve....J. C. Evans
Valve-controlling device....E. T. Pardee
Valve, Cut-off....J. L. Moore
Valve device for corrosive liquids...W. H. Smith
Valve-gear....A. Chubb et al
Valve, Rotary discharge....O. Mantius
Vaporizer, Oil....J. F. Maleom
Vegetalbe-cutter....J. Spenko
Vegetable-cutter....J. Moreau
Vegetable-masher....B. Iitsuka
Vehicle-brake, Automatie....C. E. Crumm
Vehiele canopy-top....J. Reid
Vehicle, Dumping....W. H. Phillips
Vehicle, Motor....J. A. Charter
Vehicles, Gear-actuating mechanism for motor....G. H. Lanchester
Vehicles, Pole-attaching means for....J. G. Maloney
Velocipede....G. C. Worthington
Vending-maehine....W. H. Laraway
Ventilator....J. M. Rose
Vests, trousers, &e., Means for adjusting....F. M. Schmidt
Veterinary instrument....E. G. Lawton
Violin-key....H. Harmer

Wagon, Camping....D. L. Hardin
Waist and skirt supporter....A. M. Preston
Wallet....J. R. Cardwell
Warp-beam tension device....G. Keller
Washboard attachment....M. G. Sarno
Washers, Bearing for sterlizing..W. Bartholomew
Washing-machine....T. H. Lewis et al
Washing-machine....W. E. Devore
Washing-machine attachment....S. Bowman
Washtub-cover....A. Adams
Watches and clocks, Individual hair-spring-stud index for....C. Teske
Water-bag....F. A. Gordon
Water-closet, &c., tank....G. H. Bailey
Water-closet, Ventilating....C. H. Thompson
Water-fountain....B. Kaminsky
Water-heater....D. Hanlon
Water-heater....G. C. Madsen
Water-heater....G. H. Wade
Water-power-applying apparatus..F. T. Newbery
Water-wheel....D. D. Dennis
Web-folding mechanism....E. Klein
Wedges, Manufacturing compound tapered....C. E. Sweet
Weeder....F. M. Newland
Welding-tool....W. A. Sparks
Well-strainers, Self-closing bottom for....J. A. Pollard
Well-tubing and means for connecting sections thereof....G. A. Pittman
Wheel guard or fender, Vehicle....J. O. Roberts
Wheels, Mud-scraper for....J. O. Davison
Winding, doubling, gassing, and like machine, Yarn or thread....J. Higginson Jr. et al
Windiug-indicator....J. C. Hawkins
Window....J. Cooney
Window construction, Metal....G. H. Forsyth
Wire-joints, Tool for forming....A. B. Brobasco
Wire-stretcher....M. M. Marty
Work-support....W. C. Stewart
Wrench....W. P. Lewis
Yeast compound, Dry....J. E. Yost

DESIGNS.

Dish or similar article....W. Də Goey
Hammock....D. W. Shoyer
Hammock-spreader ends, Cap for....W. J. McBride
Mantel-cover....J. Aizenman
Stove, Gas....F. U. Long et al
Təa-cup....F. Baxter
Teapot or similar article....W. C. Codman

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MECHANICAL PATENTS.

Accumulator, Hydraulic....A. W. French
Adjustable bracket....J. Knape
Advertising apparatus....A. Weismann
Aerial vessel....J. Suter
Agricultural machine....L. E. Roby
Air-compressor....V. Olsen and F. Schroder
Air compressor or pump....J. Delbridge
Air conveyer, Fresh-....E. E. Lamb
Air-heater....G. L. Bryant
Alloys, Producing low-carbon, low-silicon titanium....F. M. Becket
Alumina, Manufacture of....G. McCulloch
Aluminum cell reactance....J. J. Frank
Amalgamator....M. F. Lansdale
Amalgamator....H. A. Corliss
Amusement apparatus....J. A. and L. Voller
Amusement device....R. H. Alexander
Anchor....M. W. Hall
Animal-trap....J. M. Gunn
Anode-mold....J. F. Miller
Antiseptic....A. Liebrecht
Arch and heel support....M. E. Rice
Armor-plate, Treating....S. S. Wales
Auto-propeller....E. E. Wilson
Automatic alarm....W. H. Reiff
Automatic switch....J. Ma Godoy
Automobile buffer-bar....J. H. Sager
Axle-boxes, Means for attaching....E. J. Spahr
Bag-holding device....H. Ihme
Bag-tie....W. H. Morrill
Bait, Artificial....M. A. Burthe
Bar-fixture....F. G. Schneider and W. C. L. Zeihn
Barrel-heads in place, Means for holding....W. H. Decker
Barrel-making machine....E. F. Beugler
Basin, Wash-....J. W. Sharp, Jr.
Bath-tub seat....J. A. Skogsberg
Battery jars, Lining for storage-....A. J. Meier
Bearing for trough-conveyers, &c., Roller-....H. Bentley
Bearing, Roller-....H. Hess
Bearing, Means for introducing balls into ball-....E. Geschke
Bed, Folding....L. B. Jeffcott
Bed, Folding....J. H. Edmonds
Bed, Invalid-....J. H. Comer
Bedstead-mount-buffing machine....J. F. Gail
Belt, Drive-....A. G. Kolbe
Bench-dog....E. A. Schade
Bill-holder....I. H. P. Colleen
Binder....G. P. Wigginton
Binder....G. P. Wigginton and F. W. Hodges
Binder attachment, Self-....E. Pennington
Binding-post....L. Steinberger
Blind-stop....H. L. Beadle
Boat....C. Hoffman
Bobbin-holder....S. W. Wardwell
Boilers, Engine-setting for horizontal..G. W. Morris
Book, Manifolding copying-....C. G. C. Whyte and A. Rau
Boot and shoe forms, Holder for....T. F. McGann
Bottle-caps, Device for removing....C. F. Forsyth and F. C. Wallace
Bottle-closure....J. Richards and H. Ahnfeldt
Bottle-neck protector....V. Durand, Jr.
Bottle, Non-refillable....E. B. Barner
Bottle, Non-refillable....A. G. H. Jenssen and R. C. Weitzel
Bottle receptacle, Milk-....A. G. Brodhead
Bottle-stopper....D. Landau
Bottle, Telltale-....A. Midbo and G. Gulbrandson
Bowling-alley pin-setting mechanism..L. A. Brigel
Box or container....J. F. Byrne
Brake apparatus, Fluid-pressure-..M. Corrington
Buckle....L. H. Fishel
Building-block....E. Chapman
Building block and wall....F. J. Schuster
Buoy, Automatic locating-....J. N. Marcou and J. C. St. Peter
Bushing and check-valve, Combined reducing-....W. S. Jacobs
Bushing for pulleys, gears, and the like..H. G. Wolf
Cab-signal circuit....P. J. Simmen
Cabinet, Envelop-....H. K. Smith
Cableway....T. S. Miller
Calculating-machines, Index-plate for..J. Graber
Calendar....E. C. Mahon
Camera....I. O. Perring
Camera....H. W. Conner
Can-cap dropper....E. M. Cobb
Can-closing device....J. H. Pelletier
Can-heading machine....J. Brenzinger
Canceling machine, Letter-....L. Blessing, M. L. Aten and G. H. Poirier
Candy-pulling machine....H. S. Brewington
Cane, Wax-like product obtained from sugar-....A. Wynberg
Canopy-frame having doors....W. S. Davidson
Canopy, Ventilating-....J. N. Moody
Car....E. S. Bucknam
Car-bolster....C. H. Anderson
Car-controlling system, Electric....A. B. Stitzer
Car-coupling....C. H. Tomlinson
Car, Dump-....S. Otis
Car-fender....J. D. Wright
Car fender, Air-actuated street-....J. M. Clancy
Car fender, Street-....A. L. Mazzanovich
Car fender, Street-....G. J. Fleissner
Car for transporting ore or other material....W. C. Carr
Car, Hand-....J. D. Kerr
Car-heater....J. F. McElroy
Car, Passenger railway-....L. E. Paden
Car-seats, Wear-strip and retainer for securing coverings to the frames of....F. H. Henry
Car wheel, Motor-....G. B. Winter
Cars or the like, System of precooling fruit-....A. Faget
Carbureter....A. H. Warmsley
Carbureter....J. H. Cooper
Carbureter....C. G. Leonard
Carriage, Folding baby-....A. W. Loshbough
Cash-register....W. H. Muzzy
Cataloguing system....R. T. Close
Cement block for wall structure..W. L. Davidson
Cement, Process and apparatus for artificially aging or seasoning Portland....T. A. Edison
Chair....L. Berzon and H. Goldberg
Chair....C. L. Greilick
Check-controlled mechanism....F. C. Kainer
Chocolate confections, Machine for the manufacture of....A. H. Savy
Churn....D. Rees
Cigar, Self-lighting....D. G. Vale
Cigarettes, &c., Machine for packeting....E. L. Bracy
Clamp....D. A. Ducharme
Clod-crusher....C. G. Stelzer
Clothes-line hanger....G. T. Van Riper
Clothes-rack, Suspended....B. B. Bosworth
Clothes-wringer....A. Lovett
Clutch....G. W. Brubaker, Jr.
Coal, Briqueting....C. E. Hite
Coating machines, Holder for liquid-....R. A. Beausejour
Coin-collector....A. M. Farnsworth
Coke-drag....S. Richter
Coke-oven door....W. O. White
Collar....H. C. Miller
Comb....M. E. Purdy
Composing and casting machine, Typographical..H. Pearce and J. E. Billington
Concentrator slime-feeding device...J. B. Green
Concrete building construction....R. V. Woods
Concrete construction, Metal tie for..E. Chapman
Concrete-mixing machine....R. G. Leverich
Concrete pavements, Laying....F. S. Lamson
Concrete pile, Reinforced-....T. Stedman
Concrete-wall mold....D. A. Marshall
Containing-can....W. H. Hoyt
Conveyer....F. Eberhart
Coop, Poultry-....J. A. Emert
Cord terminal....F. Parsons
Corn-husking implement....S. B. Dykes
Corn-sheller....W. J. Moore
Cornice-brake....G. C. Keene
Couch and bed, Convertible....L. B. Jeffcott
Couch, Electrovibratory....W. A. Church
Cradle....C. H. Johnson
Cream-separator, Centrifugal....P. L. Kimball
Cream-separators, Drum for centrifugal....J. and A. Persoons
Crib....J. B. Stalter
Crushing-machine, Flexible....H. E. Greg
Cue....R. J. Preast
Cultivating-machine..K. Koszegi and E. Szechenyi
Cultivator....G. M. Roper
Cultivator....J. Hobson, Jr.
Current apparatus, Alternating-....W. Stanley
Current-collector, Underrunning..S. B. Stewart, Jr.
Current meter, Alternating-....W. Stanly
Currents, Means for rectifying single-phase....J. L. Woodbridge
Cutter-bar....E. J. Wolfrom
Cutting-tool for applique-work....W. Vogel
Cycle, Motor-....J. E. Allen
Dashboard-brace....F. H. Hosay
Dental-engine-handpiece swivel....A. W. Browne
Dentistry....M. R. Koons
Die-cutting machine....D. P. Robinson
Display-cabinet....L. W. Welch
Display-rack, Inclosed....W. K. Williams
Display sheets or curtains, Frame for....L. C. Davidson
Distilling wood-alcohol and other products, Apparatus for....B. R. and M. J. Lyster
Distributing-machines, Apparatus for the control and the registration of the operations performed by....G. I. F. Soulage
Door-check....C. L. Butler
Door-check....R. W. Hubbard
Door-closer....W. W. Bjorling
Door fan attachment....J. N. Hatcher
Door-fastener....B. B. Fairman
Door fastener, Sliding-....J. McAllister, C. G. Anderson, and B. H. Hawkins
Door-hanger....W. D. Thompson
Door, Revolving....F. Clymer and J. Degen
Door, Revolving....C. J. Cruyff
Door-stop....W. La Baw
Doors, Automatic control of water-tight....W. L. Merrill
Dosing device, Liquid-tight....E. M. Bajon
Doubling apparatus....P. E. Donner
Draft appliance....F. M. Smiley
Draft device....C. P. Hansen
Drawing instrument....C. C. Page
Dredger, Caisson-....R. A. Gardner
Drill and stay-bolt cutter, Combined..F. Fleming
Drive, Four-wheel positive....O. A. Goodrich
Drying apparatus, Hair and fur....E. Deslot
Drying sheet material, Apparatus for..C. E. Moss
Dyeing wool....H. Winslow
Egg-separator..H. H. Heatherington and C. O. Long
Elastic connecting-strap....J. J. Shea
Electric appliances, Attachment for....H. W. Denhard
Electric-cable terminal....C. W. Davis
Electric cell or battery, Primary....A. Heil
Electric-circuit controller....H. W. Leonard
Electric circuits, Means for controlling..G. W. Hart
Electric furnace....C. A. Keller
Electric furnace for gas reactions....O. Diffenbach and W. Moldenhauer
Electric machine, Dynamo-....F. B. Howe
Electric machines, Cross connection for dynamo-....R. Siegfried
Electric meter....F. M. Vogel
Electric meter....P. C. Morganthaler
Electric meter....W. Stanley
Electric switch....F. W. Smith
Electrical apparatus, Wall-cabinet for....E. R. Le Manquais
Electrical-cable terminal....C. W. Davis
Electrical-distribution system....R. J. Dearborn
Electrical-distribution system....P. M. Lincoln
Electrical-distribution system, 2 patents....J. L. Woodbridge
Electrical-distribution system....W. E. Winship
Electroplating apparatus....L. Potthoff
Elliptic spring....H. Jeffrey
Embossing appliance....L. H. Orr
Emulsion, Producing a mineral-oil....S. Knopf
Engine piston-head....A. Starke
Engines, Muffler cut-out for explosive....L. Raffalovich
Engines, Spark-timer for internal-combustion gas-....O. L. Brainard
Envelop....L. C. Van Riper
Envelop....R. Landenberger
Envelop....P. Forschler
Exhibiting apparatus....S. B. Moscovitz
Fan....L. J. Wing
Fastener....J. A. Simpson
Fastener....C. A. Conrard
Faucet for cheese apparatus....J. Brensike
Fence-post staple....J. Darling
Fender or trolley-wheel guard....J. A. MacMahon
Fertilizer-distributer....G. E. Alphin
File-box....C. Keck and A. Doin
Film-frame apparatus....B. Day
Finger-pad....J. G. Marsh
Fire-hose coupling....H. J. Hickey
Firearm....S. B. Smith
Fishing-rod....W. A. Austin
Flower-pot holder....A. Haglund
Fluid-motor....A. Mill
Fluid-pressure brake....W. P. A. MacFarlane
Fluid-pressure regulator....B. H. Petley
Flushing device, Basin-....E. Kuhn
Folding-machine....E. D. Wallace
Frame....L. B. Stetson
Freezer....G. F. Dickson
Fuel, Artificial....R. W. Howell
Fuel-feeding apparatus....R. Putnam
Furnace....L. Whittaker
Furnace, 2 patents....M. W. Sewall
Furnace bridge-walls, Protecting-cap for....J. R. Fortune
Furnace-grate....F. Girtanner
Furnaces, Smoke-consuming attachment for....W. P. Choitz
Gage....R. Atkinson
Game apparatus....W. B. Beckley
Game apparatus....A. De Meurisse
Gang-edger....U. Anderson
Garment-hanger....W. F. Freeman
Garment-support, Movable....L. G. Dodge
Garment-support, Movable....L. G. Dodge, W. Freeman, and A. Vanderveld
Garment-supports, Guard for rotary..S. D. Young
Garment-supporter....S. Kops
Gas-burner....J. Weintz
Gas-burner....B. A. Geurink
Gas-escape....H. H. Fulton
Gas-kiln....E. Schmatolla
Gases, Apparatus for cleaning....W. Ahlena and H. C. Siebert
Gearing, Change-speed....F. D. Pouch
Gearing, Friction-....G. H. Chisholm
Glass-etching machine....A. B. Knight
Glass ,Machine for making wire-....J. I. Arbogas
Glass, Method of and apparatus for drawing continuous sheets of....E. Fourcault
Glass, Method of and means for manufacture of window-....R. L. Frink
Glass-molding machine....W. J. Miller
Glass-molds, Construction of....F. M. McKernan
Glazing tile, brick, or the like....F. E. Goldsmith
Governor, Fly-ball....M. Haeberlein
Grain-treating apparatus....E. Sorenson
Grates,Shaker for fire-..A. T Zuech and G. H. Diemer
Grating, screen, screen-door construction, and the like....E. McClure
Grease or lubricant cup....G. W. Bowen
Gun-support....C. O. Lawson
Guns, Range-keeper for....A. T. Dawson and J. Horne
Gymnasium-horse....A. J. Thornley
Gyve....F. C. Nagle
Hair-tonic....S. Tsorones
Harvester-reel support....J. A. Scanland
Hasp-lock....A. J. French
Hat, Felt....E. L. Wales
Hats and other head-coverings, Sweat-band for..J. W. Kolsch
Hatch-cover and operating means therefor....L. D. Lovekin, P. M. Young, and H. Krapp
Heat-retainer....F. H. Daniels
Heater....G. W. Bowman and J. A. Becraft
Heating and melting furnace....W. N. Best
Hinge, Invisible....H. R. Canfield
Hitching and steering device....L. B. McAlpine
Hoisting appliance....I. C. Moulton
Hollow bodies, Means for extruding...A. P. Hine
Hopper and soil-pipe cleaner, Extension-....W. H. Cloak
Horse-boot....R. H. Smith
Horseshoe....T. L. Randall
Hose coupling, Air-....F. W. Rock
Hose-coupling, Expansion....H. C. Bostian
Hose-rack....G. F. D. Trask
Hot-water house-heater....M. A. Wilcox
Hub-attaching device....C. C. Swanson
Hydraulic jack....E. A. Gathmann
Hydraulic separator....W. F. Smith
Ice-making apparatus....D. J. Havenstrite
Indicator....A. J. Border
Indicator....H. E. Golden
Induction-furnace....M. Unger
Insect-destroyer....A. Swainson
Instrument and medicine case....C. B. B...
Insulating bodies, Producing....V. A. Noodt and G. Gotts...
Insulating-coverings for electric conductors, Making....W. A. Phillips and F. Hutchin
Internal-combustion engine....R. Luca
Ironing-board cover....E. Ston
Jar-closure....G. Henderson
Jar-closure....J. Schie...
Jewel-setter's tool....F. C. Widmann
Jewelry-box....J. R. Sundee
Joint connection, Universal-....J. B. Jourdain and L. Dextraze
Journal-box....L. K. Smith
Keyhole-illuminating device....J. D Hardin and J. B. de Saussure
Keyless socket....C. D. Platt
Kinematograph apparatus for the production of colored pictures....G. A. Smith
Kitchen-rack, Foldable....R. Rothengatter
Knob fastener, Door-....F. E. Beardsley
Lamp adjustable support, Electric-....L. Erikson
Lamp, Incandescent....R. D. Tiffany
Lamp, Miner's....J. and A. M. Van Liew
Lamp operating device, Vehicle-....J. P. Stein
Lamp-socket switch, Incandescent-....W. A. McDonald
Lamps, Sealing filament-carriers into bulbs of electric incandescent....J. Kremenezky
Land-roller....E. Englund
Lantern....O. R. Henson
Lantern, Signal-....J. J. McIntyre
Last....H. F. Loewer
Last, Shoe-....A. C. Hayden
Latch-bolt for doors....J. R. Potts
Lathe....L. H. Vold
Lathe....C. D. Fischer, Jr.
Leaf holder, Loose-....E. E. Tait
Leather-staking machine....A. C. Brill
Ledger, Loose-leaf....H. F. Bushong
Level....M. Ichtertz
Life-saving apparatus....M. A. Mueller
Loading and unloading device....T. Fullbright
Lock....N. T. Foster and B. M. Dreska
Locks and latches, Safety-guard for..G. E. Hosch
Locomotive ash-pan....F. L. Roberts
Locomotive track-sander....H. L. Lambert
Loom let-off mechanism....J. Northrop
Loom picking-motion....W. H. Ayer
Lymph, Making preventive and curative..S. Krafft
Mail, express, and train orders, despatches, &c., Apparatus for effecting the interchange of....N. J. Nelson
Manhole cover-plate....E. Oldman
Manure-spreader....D. Garst
Manure-spreader (reissue)....E. C. Littlefield and D. Garst
Match-scratcher....G. A. Barnes
Measuring apparatus....G. A. Cowen
Measuring apparatus, Hat-frame-wire....W. M. Jameson
Measuring instrument, Optical distance-....F. Dubenhorst
Mechanical movement....R. T. Johnston
Medicine-dispenser....F. M. Beverly
Merry-go-round....C. W. Ott
Merry-go-round..N. M. Powell and J. L. Miller
Metal sheets, Manufacturing....C. W. Bray
Meter....W. L. Gumprecht
Milk pasteurizer and cooler....W. R. Thatcher
Milking-machine....K. I. Lindstrom
Miter-clamp....J. L. Taylor
Mixing-machine....O. H. Weckesser
Molding-machine..W. F. Kerlin and E. W. Bowen
Molding-machine....W. Lewis
Motor-control system....H. E. White
Motor-generator set....W. A. Danielson
Motor, more especially applicable for driving barges, wherries, flatboats, and the like....G. Trouche
Motor-starter....M. R. Hanna
Music-record sheet for automatic piano-playing mechanism and the like....A. R. Trist
Musical instruments, Note-accenting device for....T. P. Brown
Negative-developer....J. S. Miller
Net-frame, Landing....F. M. Spiegle
Nozzle, Regulating-....W. A. Doble
Nut-lock....K. and B. Nagyvathy
Nut-lock....W. W. Senn
Oar-rack....E. G. Hodgkins
Oil-burner....J. Weintz
Oil-burner....J. N. Young
Optometer....J. H. Martin
Optometer....H. L. De Zeng
Ore separating or concentrating apparatus....G. F. Godley
Ores, Treating certain....H. S. Auerbach
Oven door, Bake-....J. M. Hoepfl
Package-tie....G. L. Hindman
Packing-machine....J. Fassino
Packing material....L. H. Baekeland
Packing, Piston-rod....A. J. West
Packing ring, Piston-....T. H. Renaud
Packings, Lap-joint for....J. T. Wilson
Pail, Dinner-....W. A. Edwards
Paper-making apparatus....W. H. Decker
Paper-making machine....J. A. White
Paper-making-machine-cleansing device....A. T. Wyant
Paper package, Toilet-....G. T. Johnson
Paper receptacle....C. F. Jenkins
Paper sheets together, Machinery for separating, feed, and cementing....W. Fricker
Paste to cardboard, &c., Machine for applying....J. McKibbin
Peanut-shelling machine....R. M. Newland
Pen, Composite....J. F. Betzler
Pen, Reservoir-....W. W. Sanford
Pencil holder and sharpener, Combined....C. H. Haase
Pencil-sharpener....R. F. George
Perforating-machine....L. W. G. Flynt
Phonograph attachment....H. A. Smith
Piano-player, Electropneumatic....A. R. Trist
Piano tuning-pin....F. Sack and F. A. Tyler
Pipe-hanger support....R. A. Jenckes
Pistol, Automatic....R. Wiles
Pitman-box....C. M. Jennings
Plant-pulling implement....W. H. Miller
Planter attachment....W. C. Reynolds
Planter, Corn-....A. J. Anderson
Planter, Corn-....G. M. Gorman
Planter, Potato-....W. A. Hall, Sr.
Planter, Seed-....W. N. Jay
Planter-shoe truck...W. N. Kilby and S. W. Kerr
Plate-bar-heating furnace....L. C. Steele
Plates and sheets, Manufacture of..D. S. Brookman
Plates and sheets, Manufacture of....S. A. Davis
Plow....E. M. Buckhannan

Plow, Disk.....E. H. Sholar and W. W. Pace
Plow fender, Double-shovel-.....K. B. Faris and J. D. Walker
Plow-points, Automatic device for attaching and releasing.....C. E. Logan and A. R. Barnett
Plow, Reversible disk.....E. H. Sholar
Plow, Sulky-.....W. H. Lee
Plows, Spreading attachment for.....H. M. Jack
Pneumatic cleaner.....S. Markstein
Pole, Vehicle-.....C. B. Schleichter
Power-operated machines, Safety trip device for.....C. F. Pfalzgraf
Primary battery.....C. E. Hite
Printing and folding machines and the like, Automatic sheet-feeder for.....H. Hollings
Printing in colors.....J. R. Brown
Printing-machine, Combined perfecting or two-color.....H. A. W. Wood
Printing-press sheet-feeding apparatus.....C. Hermann
Projection-apparatus attachment...W. J. Ashley
Pulp-shaping machine.....A. Komp
Pump.....A. W. Schramm
Pump, Centrifugal.....D. V. Burrell
Pumping or forcing mechanism, Air..H. Harsant
Puzzle for the blind, Raised.....M. A. Houghton
Rail-fastener.....G. M. Cote
Rail-fastening device.....J. E. Hanique
Rail-joint.....M. Thorson
Rail-joints, Splice-bar for.....W. P. and S. G. Thomson
Rail-tie.....W. Churchill and M. L. O'Neil
Railway and rail-support therefor.W. L. De Remer
Railway-joint.....G. W. Amos
Railway-rail.....S. W. Lyman
Railway-rail brace.....E. J. Anthony
Railway-rail-locking mechanism....E. J. Anthony
Railway-switch device.....G. R. Johnson
Railway-switches, Manufacture of slide-plates for.....R. J. Davidson
Ratchet-drill.....G. W. Figg
Razor-blade clamp.....A. H. Fleming
Reamer.....A. E. Church
Refrigerating apparatus.....W. W. Seay
Refrigeration, Process of.....W. W. Seay
Register or ventilator.....E. D. House
Register or ventilator.....H. S. Hart
Relay.....T. W. Gleeson
Relay.....E. R. Corwin and C. A. Bals
Rheostat.....G. H. Dorgeloh
Ribbon-reversing mechanism, Automatic ink-.....R. E. Benner
Rifle practice, Sand-box for.....H. P. Maxim
Ring-clamp.....F. C. Widmann
Road and land leveling machine.....W. Kaiser
Road and street construction.....J. H. Amies
Rock-drill, Internal-combustion, 2 pats.L. L. Scott
Rolling ribbed bars.....T. W. Jenks
Rotary combustion-engine.....F. Fleming
Rule.....P. F. Burns
Rule.....G. A. Mongelli
Sad-iron.....C. W. Wodznski
Safe, Revolving.....J. S. McCormick
Sanding, abrading, or polishing machine.....F. Schimmel
Sash, Metal window-.....F. E. Duering
Saw.....R. Hoe, Jr.
Saw.....A. P. Fridstrom
Saw jointer and gage.....C. C. Du Bose
Saw resawing-machine, Band-....C. E. Cleveland
Scale.....W. F. Stimpson
Scale, Automatic weighing-.....M. E. Reisert
Scale, Weighing-.....A. H. Neureuther
Self-sealing can.....J. F. Ross
Sewing-machine power-transmitter...A. B. Cohn
Shade hanger, Window-.....B. F. Gindlesperger
Shaker-screen, Vibrating.....L. C. Dibert
Sharpening device, Razor-.....W. H. Dunn
Sharpening machine, Coal-puncher-.....J. B. and W. W. Word
Sharpening razors and razor-blades, Device for..F. Myers
Shears.....J. R. Scaright
Sheet-metal supporting-arm.....B. W. Sweet
Sheet-metal-working press.....E. Norton and L. C. Krummel
Shell-feeding machine.....H. A. Stillwell
Shipping-box.....M. B. Claff
Ships' helms, Mechanism for indicating and recording the movements of.....F. M. Russell and A. J. Jung
Shock-absorber.....H. C. Turner
Shoe-tree.....T. G. Redington
Shoe tree or form.....W. H. Baynard
Shutter-operator.....A. Weber
Shutter-releasing device.....H. A. Tierney
Siding.....I. S. Conover
Sifter, Ash-.....J. S. Brown
Sign for advertising purposes, &c., Changeable..C. D. Chadbourne and W. R. Simpson
Silo-doors, Interlocking lever for...W. A. Holnagel
Sinew-extractor.....G. A. Congdon
Skinning and cutting tool.....C. E. Wallder and H. M. Ashton
Sliding gate.....F. H. Doering
Slip-indicator.....G. A. Johnstone
Smoke-preventive apparatus.....I. M. Sullivan
Sodium salt of lactalbumin, Making a neutral....E. Fisher and P. Bergell
Solder, Aluminum.....J. Wirgovits
Sound-records, Production of double-faced.....F. L. Capps
Speed-changing device.....D. O. James
Speed-indicator governor.....A. Grossmann
Speed mechanism, Change-.....C. B. Elmore
Spike-holder.....H. O. Crippen
Spinning apparatus, Traverse-motion for yarn-, 3 patents.....A. E. Rhoades
Spinning-machine speed-changing device.....F. H. McDevitt and A. Walton
Spokes, Tenon-forming machine for wheel-.....E. and E. E. Davis
Spool and twine holding device.....H. Reicherter
Sprayer, Portable.....A. B. Morgan
Spring fabric.....H. E. Gates
Spring-fastener.....F. Bowen
Spring-wheel.....C. W. Baeder
Sprinkler.....J. W. Campbell
Stacker, Pneumatic.....P. Miller
Stacker, Pneumatic straw-.....G. H. Bathrick
Steam-generator.....J. C. Parker
Steam-trap, 2 patents.....J. W. Barton
Steps, Safety device for treads of....A. I. Davis
Stereopticon-slide carrier.....P. R. Hoy
Stereotype-trimmer.....C. W. Baeder
Stoker.....G. Andersen
Stoker, Locomotive mechanical....D. F. Crawford
Stop-motion, Twister.....A. E. Rhoades
Stove.....E. R. Cahoone
Stove, Gas-.....S. H. Blodgett
Stove stand, Gas-.....W. F. Krumsee
Stovepipe-elbow.....D. Witt
Street-sweeper..J. F. Wurzer and J. G. Hartman
Sweeping apparatus.....J. Cable
Switch handle, Electric-.....J. G. Peterson
Switch-keys, Bank of locking.....E. R. Corwin and C. A. Bals
Switch-point lock.....J. M. Shaul
Switch-stand.....C. Raiter
Switch-stand...C. W. Reinoehl and C. W. Long
Switches, Control of electrically-operated.....A. S. Cubitt
Synchronizing apparatus.....P. Pierini
Syringe.....J. W. Short
Tank.....E. E. Straw
Target-practice apparatus, Coin-controlled.....H. H. Cummings
Telemeter for two successive observations.....C. Pulfrich
Telephone-connector, Intermediate.....C. A. Hearn and W. H. Feddejohann
Telephone, Desk-....E. R. Corwin and C. A. Bals
Telephone-exchange system.....C. L. Zahm
Telephone-line selective switch device.....J. H. Swanson
Telephone system.....H. G. Webster
Telephone-users, Indicating coin-holder for.....E. F. Stone
Telephony and telegraphy, Wireless.....A. W. Sharman
Telpherage system.....H. Muller
Tent, Portable.....A. F. Leach
Textile-conditioning apparatus.....I. E. Palmer
Textile stock, Composition for dressing...E. Dath
Thermo-electric generation.....J. D. Taylor
Thermometer, Oven-.....L. S. White
Tie and rail-fastener.....A. M. Moylan
Tiling machine, Block-.....W. P. Meeker
Tire for vehicles, Cushion-.....E. E. Euchenhofer
Tire, Pneumatic.....C. M. Gautier
Tire-shoe-manufacturing machine, Pneumatic-....W. C. State
Tire, Spring-.....W. L. Johns
Tool-handle.....E. Zinn
Tool-holder.....C. Grunder
Tool, Pneumatic.....R. H. Wallace
Tool-support for tools or tool-holders.G. C. Barnes
Tools, Protecting arrangement for rotary.....P. G. C. Lundberg
Tooth-regulating device.....J. Aderer
Toy and game trap-shooter.....C. A. Evans
Toy flying-machine.....J. Stomberg
Toy, Rolling.....O. Prior
Trace-hook.....A. P. Hoard
Track construction.....H. Ehman
Track-lifter.....R. B. Wakeley
Track, Overhead.....A. H. Neller
Trains, Means for transferring passengers to and from moving.....J. Ross
Transmission-controller.....C. E. Cox
Transmission mechanism, Friction.....J. Becker
Trolley-catcher.....C. I. Earll
Trolley-retriever.....C. Palm
Truck, Car-.....C. B. Goodspeed
Truck, Power-.....J. B. Heverling
Trunk.....W. T. Fuller
Trunk-harness.....A. D. Williams
Tube.....H. I. Van Nostrand
Tug or carrier, Thill.....W. R. Noggle
Turbine-blade.....H. S. Loud and J. Panter
Turbine-blade-holding means.....C. Gilson
Turbine-blading.....J. E. Snyder
Turbine, Compound.....G. Meyersberg
Turbine-controller.....W. A. Loudon
Turbine, Elastic-fluid.....G. Westinghouse
Turbine, Elastic-fluid.....R. N. Ehrhart
Turbine, Marine.....G. Westinghouse
Turpentine-cup.....E. A. McKoy
Twine-cutter.....J. H. Keating
Twyer, Injector-.....G. A. Williams
Type setting and casting machine, 2 patents....O. Koske
Type-writer cabinet.....M. Foley
Type-writers, Paper-feed for.....E. S. Mansfield
Typographic machines, Keyboard mechanism of..H. Pearce
Umbrella, Folding.....J. Casale
Umbrellas and parasols, Securing notches to sticks of.....J. B. Riehl
Vacuum-cleaner, 2 patents.....I. L. Green
Valve.....W. C. Marsh
Valve, Automatic air-.....J. P. Marsh
Valve, Automatic antiscalding and mixing.....F. L. White
Valve, Dry-pipe.....H. G. Baker
Valve for steep-tanks.....J. F. Dornfeld
Valve-gear for engines.....T. Jolma
Valve mechanism for heating apparatus.J. L. Fitts
Valve-replacing apparatus.....E. W. Goodwin
Valve, Safety-.....J. C. Watson
Valves of washbasins, bath-tubs, or other receptacles, Mechanism for operating the outlet-.....J. Miller
Vault, Grave-.....S. Fry
Vehicle-brake.....W. T. Hinshaw
Vehicle construction, Motor-.....E. Gruenfeldt
Vehicle cushioned wheel.....W. J. Higman
Vehicle, Foot-propelled.....N. R. Thibert
Vehicle-propelling means.....J. C. Leydorf
Vehicle-seat.....F. J. Elsner
Vehicle-wheel.....H. O. Clark
Vehicles, Antislipping tread attachment for motor-.....M. Jensco
Vehicles, Pilot-light-shifting attachment for.....E. E. Hampton and C. G. Smith
Vending device, Liquid-.....H. G. Cordley
Vending machine, Food-.....I. O. Carlson
Vent-cap.....J. R. Williams
Ventilator and smoke-consumer, Combined.....J. Wood
Vessels, Determining positions of.R. A. Fessenden
Vise, Fluid-actuated.....J. Sistek and J. Spinka
Voting-machine, 2 patents.....J. H. McElroy
Voting-machine interlocking mechanism.....J. H. McElroy
Wagon side-board attachment.....A. Sanders and C. M. Rebman
Wainscoting, walls, and the like, Composition of matter for the finishing-coat on....G. Clapham
Wall-covering.....W. M. Stevenson
Washing-machine.....M. M. Hanson
Water closet and tank.....J. W. Sharp, Jr.
Water-heater.....H. R. Churchill
Water-heater.....B. B. Kinkade
Water-heating system.....B. B. Kinkade
Water-meter.....H. I. Dilts
Water-tube boiler.....J. P. Sneddon
Water-wheel.....W. Van Scoter
Weigher, Automatic grain-.....L. S. Godfrey
Well-capping device, Oil-.....F. M. Henning
Wells, Apparatus for firing explosives in.....L. H. Broadwater
Wheel.....F. E. Bertrand and G. Portsche
Wheel.....J. W. Meyer
Wheels, Apparatus for treating wooden..J. J. Lipe
Wick-burner, Incandescent.....J. Herzog
Wigs, Parting foundation for.....P. E. Tattoon
Windmill-regulator, Automatic....C. C. Peterson
Window-pane fastener.....D. D. Crouse
Wire and wire-fabric stretcher.....R. W. Sibley
Wire-stretcher.....J. Morehead
Wire-working implement.....C. J. Smith
Wrench.....C. C. Swanson
Wrench.....H. M. Gaines
Yoke, Neck-.....C. B. Schleicher

DESIGNS.

Bag, Chatelaine-.....J. Lambert
Clock-case.....F. J. and W. C. Van Cise
Cup, Drinking-.....E. B. Sowers
Dish.....S Hentschy
Ice-cream-freezer casing.....S. H. Bunnell
Lamp-shade.....W. J. Gray
Lamp socket, Electric-.....R. B. Benjamin
Light shade, Artificial-.....K. Booth
Spoon, fork, or similar article.....G. P.Tilton
Stove.....F. U. Long and M. L. Packer
Syringes, Reservoir for fountain-....D. W. Keith

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MECHANICAL PATENTS.

Abrasive composition and making same.....L. H. Baekeland
Acrobatic purposes, Sphere for.....C. F. Demek
Aerial navigating apparatus.....L. Felker
Aeroplane, Gyroscopic.....S. S. Williams
Air-compressor.....A. T. Newell
Air-trap, Automatic.....R. N. Dyer
Alarm apparatus.....H. R. Bretney
Alloys, Producing ferro.....E. F. Price
Amusement apparatus.....A. C. Wolf.
Amusement of the public, Apparatus for the.....W. Taylor
Animal-trap.....A. Brecheisen
Animal-trap.....R. M. Wilbur
Antidrifting device.....E. Gunnell
Arm-chair and folding bed.....J. C. Smith
Auto, Baby-.....J. R. Spencer
Automobile controller, Electric-.....H. P. Dodge
Automobile drip-pans, Valve for.....T. A. Yapp
Automobile-radiator.H. P. Smith and L. E. Hooker
Automobile wind-shield.....A. W. Towle
Automobiles, Sleigh attachment for.P.M.Knutson
Axle, Automobile-.....M. D. Tindal
Baby-gate.....G. Heidt
Bag-holder.....H. Woodman
Baggage-fastener.....J. B. Moses
Baking-powder.....J. H. Hooker
Baling-machine...W. H. Hansen and A. J. Price
Bank, Portable savings-.....J. H. Gunnes
Bearing, Ball-.....G. A. W. Koch
Bearing, Roller-.....F. M. Foote
Beating and mixing machine.....F. H. Van Houten and H. M. Bachman
Bed attachment.....P. H. Wilson
Bed, Couch-.....H. D. Penney
Bed head-rest.....J. G. Ryan
Bedstead.....J. Westhaver
Belt-shifter.....J. A. Long
Belt-shifter support.....C. W. Levalley
Binder, Loose-leaf.....G. O. Olson
Block-mold.....E. May
Blowpipe.....J. F. Williams
Boat, Compound.....J. D. White
Boat-planking, Securing means for.....J. M. Alexander and M. Willhahn
Boiler-scale removers, Container for.G. O. Leonard
Boiler-tube cleaner.....W. S. Elliott
Boiler-tube cleaner.....J. V. Symons
Boots and socks, Excluder for felt and knitted....F. W. Savage
Boring-machine.....G. D. Wiggins
Boring-tool, Automatic.....J. A. Leland and W. G. Stebbins
Bottle closure.....W. H. Reid
Bottle closure and seal.....O. N. Tevander and A. Manierre
Bottle, Drenching-.....C. B. Davis
Bottle, Non-refillable.....F. S. Novotny
Bottling-machine.....R. Littler
Box.....H. H. Kinsey
Box-cover fastening.....F. H. Moellenbrock
Box-fastener.....C. O. Mason
Brake-shoe.....C. B. McPhillips
Brake-shoe, Interlocking.....H. Jones
Brooder.....A. J. Blowers
Brush-chopper.....J. Porteous
Brush-holder.....A. Kimble
Brush holder, Tooth-.....C. H. DeGowin
Buckle, Cross-line.....H. B. McGowan
Building-block.....W. C. Denison
Building-block, Fire-clay.....J. O. St. John
Building material, Apparatus for distributing ....J. H. McCoy
Button, Cuff-.....H. Ginnel
Button-setting instrument.....J. F. Thayer
Buttonhole-cutter.....F. F. Roby
Cabinet, Credit-.....R. M. Vick
Calculating device.....C. H. Miller
Calculating-machines, Number-wheel lock for....W. L. Dench
Calipers.....G. T. Young and A. H. Gleason
Can-body machine, Automatic-feed..W. E. Taylor
Candy-machine.....J. Smith
Candy-twisting machine.....W. D. Reeves
Cans, Discharge-spout for.....J. A. Sauer
Car brake, Dump-.....L. P. Gaston
Car brake, Railway-.....L. De Vito
Car construction.....J. F. Streib
Car-couplings, Automatic.....O. F. Richter
Car-couplings, Uncoupling-chain for..G. G. Davis
Car-door.....F. X. Malocsay
Car door, Grain-.....W. S. Driskell
Car-door hanger and track, Combined..E A. Hill
Car-door mechanism.....R. V. Sage
Car, Dump-.....H. E. Thompson
Car-fender.....J. J. Kelly
Car-fender.....J. Flynn
Car-fender.....J. A. Horne
Car grain-door.....R. C. Russell
Car, Passenger-.....P. M. Kling
Car-replacers, Ratchet-clamp for.....W. Gakle
Car-roof.....E. C. Covert
Car-unloading apparatus.....J. W. Page
Car-ventilator.....F. J. Linehan
Car-wheel, Forged steel.....J. M. Hansen
Car-window.....T. A. Legge
Cars and similar structures, Trap-door for railway-.....E. F. Chaffee
Cars and similar structures, Trap-door for railway-.....O. M. Edwards
Carbureter...T. W. L. McGuire and L. Hammick
Carbureter for hydrocarbon-engines..S. R. Jacobs
Card and picture holder.....J. A. Cope
Carline.....J. J. Hoffman
Carpet fastener, Stair-.....W. W. Hesson
Carriage-curtain fastener.....F. S. Carr
Cartridge and game belt.....W. A. Wiley
Cash-register indicator.....A. J. Postans
Caster.....J. E. Johnson
Casting-machine.....F. H. Howard
Catapult.....R. C. Winchester
Cattle-guard.....S. C. Dunn
Cement-kiln.....T. M. Morgan
Cement-lined pipe and fittings.....F. H. Caney
Cement-mixer-feeding device.....H. C. Baxter
Chain-manipulating tool.....J. H. Shelley
Chain securing and releasing device.....W. S. Ferguson and A. W. McMichael
Chair.....W. P. Lawrence
Chair.....J. Flindall
Chair and couch, Combination.....J. Flindall
Chair-coupling.....G. E. Linder
Chair head-rest,Barber-.....A. L. Undeland
Chair-iron.....H. W. Bolens
Chaplet-riveting machine.....V. Davis
Check and seal, Combined.....W. E. Elliott
Chuck, Drill-.....P. Steiner
Chuck, Self-centering.....B. Bomborn and A. Hoffmann
Chute and can, Garbage.....E. Bradshaw
Cigar lighter and cutter, Combined..G. W. Britton
Cigar-presser.....S. G. Lipschutz
Cigarette-tipping machine.....S. Palmowsky
Circular cutter.....R. D. Klnyon
Cistern-cleaner.....J. H. Fox
Clamp-locking device.....J. Begins
Clock and the like.....J. Buhler
Closure.....F. Ecaubert
Clothes-drier for laundries.....E. E. Wlngate
Clothes-pin.....A. C. French
Clothes-pounder.....C. A. Robertson
Clutch, Friction-.....H. A. Cumfer
Clutch, Friction-.....P. B. Marfield
Clutch, Friction-.....A. Llnt
Clutch, Magnetic, 3 patents...H. W. Ravenshaw
Clutch mechanism.....J. Boda
Clutch or brake, Magnetic.....H. W .Ravenshaw
Coal-dust burner.....J. W. Zell
Coal or ore washer.....E. Prochaska
Coal-separator, Centrifugal dry.....A. Ernst
Coaster-brake.....C. A. Baylor
Cock, Non-scalding shower-bath..D. W. McNeil
Coffee-pot.....J. A. Holmgren
Coke-handling apparatus.....D. McDonald
Collar, Metal-framed horse-.....W. Hardwick
Comb-cutting device.....F. Shatz and B. Van der Hoek
Concentrator and amalgamator..J. I. E. Nelson
Concrete columns, Means for constructing.....P. A. and L. P. Deslauriers
Concrete construction.....C. W. Horton
Concrete construction, Metallic reinforcing-bar for.....R. J. Grace
Concrete dam.....H. A. Icke
Concrete piling, Reinforced-.....J. P. Holmes
Concrete structure, Reinforced.....M. Dumas
Concrete structures, Apparatus for building hollow.....J. H. McCoy
Condensation product and making same.....L. H. Baekeland
Condenser, Surface.....Y. Wadagaki
Condiment-shaker.....E. Gabhardt
Conduit, Flexible.....C. H. Miller
Conduit, Flexible electric.....C. H. Miller
Conduit for electric wires.....C. H. Miller
Conduit for electric wires, Flexible...C. H. Miller
Container-top.....B. T. B. Hyde
Controller-regulator.....C. M. Feist
Converter hood and flue.....A. P. Turner
Converter, Metallurgical.....W. H. Peirce
Cooker, Can-.....J. Cook
Cooking utensil.....A. Speirs
Copper-matte converter.....E. A. C. Smith
Copper matte, Method of and converter vessel for bessemerizing.....W. H. Peirce and E. A. C. Smith
Corn-rack.....J. S. Winton
Corset.....C. MacMahn
Cotton-chopper.....N. T. Speer
Cotton-chopper.....W. B. Alexander
Cotton-compressor.....B. C. Gallaread
Couch, Suspensions.....H. L. Hohlfeld
Coupling device.....L. Iversen
Crayon, lumber-gage, and tally-pencil, Combined.....C. P. Breining
Crib and baby-carriage, Combination.....A. Hendricks
Cue.....W. M. Dall
Cultivator.....C. W. Brown
Culvert.....L. Schnuerer
Culvert, Corrugated-metal.....A. G. Hague
Curtain-fixture.....B. W. Coddington
Cushion-wheel.....E. J. Pope
Cut-off, Automatic.....P. Dixon
Cutting-machine.....A. C. Bolton
Cutting mechanism.....W. S.Metcalfe
Cycle-saddle.....T. Bettney
Desk, Portable writing and drawing..T. E. Stark
Detachable bracket.....D. M. Ireland
Die-cutting machine.....D. P. Robinson
Diphenyl-ortho-oxalic esters, Making.....H. Schneider
Direction and distance locator.....W. H. Dolby
Dish-washing machine.....H. Mury
Dispensing apparatus.....R. G. Marsh
Display-rack.....J. A. Nickerson
Door attachment, Screen-.....C. Spencer
Door-check.....D. Desplats
Door closer and stop, Combined....H. C. Moore
Door-closing device, Swinging-.....W. H. Knapp
Door-hanger.....J. H. Lawrence
Door-holder.....H. M. Daly
Door-operating mechanism....R. M. Zimmerman
Door or other alarm.....J. Seelhorst, Jr.
Door-stop.....J. L. Webb
Dough in the manufacture of bread, Machine for rounding up lumps of....F. H. Van Houten, Jr.
Dough molding or shaping machine.....F. H. Van Houten
Draft appliance..W. Tiernan and H. M. Schreiber
Draft-rigging, Friction.....C. K. Brooks
Drying timber and other moisture-bearing substances, Rapidly.....H. D. Tiemann
Drill-brace.....W. J. Parsons and J. A. Leland

Drill-guide, 2 patents....A. C. Neal
Drinking-tube....J. L. Clarke
Dust-collector....O. M. Morse
Duster....R. S. Melchers
Dyeing....F. H. Daniell and J. C. Hebden
Dyeing, Yarn-support for....J. C. Hebden and F. H. Daniell
Dynamo-brushes, &c., Manufacturing....G. Egly
Egg-tester....E. Leiss
Electric apparatus, Vapor, 2 patents..H. I. Wood
Electric apparatus, Vapor....L. E. Dempster
Electric-circuit-controlling relay....B. Menkin
Electric drill....P. J. Lincoln
Electric furnace....F. T. Snyder
Electric furnace....E. F. Price
Electric furnace with raised charging-pit....A. Helfenstein
Electric generator....G. A. Huber
Electric heater....G. E. Stevens
Electric lighting....C. P. Steinmetz
Electric resistance apparatus....M. Hankin
Electric switch..W. L.R.Emmet and E.M.Hewlett
Electric transformer and governor....E. R. Cliff
Electric wires, Connection-rosette for..J. L. Burton
Electrical conductor....I. Kitsee
Electrical contact device....C. F. Jenkins
Electrodes, Securing metal contacts to carbon....S. Benko
Electrolyte and electro depositing nickel....E. F. Kern
Elevator-door opener and closer, Automatic safety....F. F. Boyd
Engine primer, Gasolene-....A. H. Linaweaver
Engines, Fluid-cooling means for gasolene or other....M. A. Fesler
Envelop....L. R. Swett
Evaporating apparatus....C. Ordway
Excavating or hoisting apparatus....J. L. Potter
Exhaust-head....J. W. Parker
Exhibiting apparatus....C. D. Whittredge
Explosive engine....J. D. Hay
Expressing-press....A. W. French
Eyeglass-holder....W. H. Bradshaw
Fastener....F. D. Broga
Fastening device....C. W. Stark
Fastening device....F. S. Carr
Fastening for loops and the like....W. M. Jones and H. Stewart
Fence-brace....G. Schneider
Fence-post, Metallic....E. C. Kahn
Fence, Snow-....H. J. Schweitzer
Fence-wire clamp..J. T. Grayson and J. I. Heintz
Fender....A. W. Shank
Fibers, threads, and fabrics, Improving textile....G. Kraemer
Figure, Jointed sheet-metal....F. C. Sneyd
Filing-cabinet....J. R. Ryan
Filter (reissue)....J. T. H. Paul
Filter-press....E. W. Heller
Fire-escape....J. B. Albert
Fire-escape....L. Vogl
Floor-dressing machine....L. H. Veronneau
Floor-dressing machine....S. D. Hoy
Flower-pot holder....C. H. Keitsch
Flue-block mold....O. C. Hiatt
Flue-cleaner....S. S. Poole
Fluid-pressure engine....C. P. Ebersole
Folding box or crate....R. Hohenstein
Foot and leg rest....J. Flindall
Foot, Artificial....J. F. Rowley
Foot-power moter....W. Hargrove
Fore-carriage....J. W. Gamble
Fruit-picker....E. A. Ableman
Fuel composition and producing the same....L. R. Palmer
Fuel, Economizing...D. Allen and A. C. Pyper
Furnace....M. Zippler, Sr.
Furnace-door....G. de Grahl
Furnaces, Gas-analyzer for....C. O. Mailloux and H. J. Westover
Furrow-opener, 3 patents....L. T. Rasmussen
Fuse, Automatic self-indicating....F. B. Cook
Game apparatus....W. J. Rigney
Game apparatus....W. Stevenson
Game apparatus, Base-ball-....J. W. E. Dean
Game-board....F. G. Rempe
Game-schedule....C. H. Lovell
Garbanzon hulling and separating machine....D. E. J. Brockett and F. Garver
Garment....M. Lang
Garment, Inner....J. W. Appleton
Garment-supporter....D. H. Haywood
Gas-burner....L. H. Brady
Gas-burner....H. S. Humphrey
Gas, Contrivance for saturating liquids with....F. Trosiener
Gas cut-off, Safety....H. Tullis
Gas-holders, Low-limit valve for....L. Shaw
Gas lighting and extinguishing apparatus....A. E. Broadberry
Gas-lighting apparatus....G. E. Hulse
Gas-mains, Automatic cut-off for...C. E. Lahmers
Gas-pressure regulator....O. Sprecher
Gas-producer....O. K. Zwingenberger
Gas, Retort for the manufacture of alluminating-2 patents....C. W. Isbell
Gas-treating apparatus....D. C. McIntire
Gate....W. D. Whitney
Gearing....H. M. Baker, Jr.
Gearing....J. C. Potter and J. Johnston
Gearing, Double back....J. C. Pflanger
Gearing, Transmission-....C. B. Kurtz
Gearing, Transmission-....L. C. Norton
Gin-saw cleaner....A. N. Tumlin
Glass articles, Manufacture of....C. B. Lawton
Glass-cutter....J. W. Tucker
Glass panes, Metal frame for....A. Busse
Glass-washing apparatus....C. W. Jaycox
Glove, Swimming-....C. Iverson
Gold, Apparatus for washing out placer-....S. Rachelman
Golf-club....F. E. Rigden
Governor for internal-combustion engines....E. Higgins
Grader and scraper, Road....S. Richardson
Grain-cutter....L. Clark
Grass digger, Quack-....J. Hopkins
Grid resistance....H. J. Wiegand
Grinding-machine, Portable....C. W. Danglemeyer and J. J. Connors
Grinding-mill....G. E. Sovereign
Grinding-mill....J. Bercha
Grinding or pulverizing machine....A. H. Petersen
Gun, Automatic..A. T. Dawson and G. T. Buckham
Guns, Single-trigger mechanism for double-barrel....J. D. Russ
Hair-cutting instrument....F. B. Walter
Hair-supporter....J. Latsch
Hame....W. L. Price and H. E. Schenck
Hame-fastening....J. H. Bankson
Hammer, Drop-....L. P. Blot
Hammer, Pneumatic power-....A. Berner
Hammer, Power-..T. Scott-King and W. Norris
Hammocks, &c., Resilients bottom for couch-....I. E. Palmer
Harmonic signaling system....R. H. Manson
Harrow....G. A. Olson
Harrow, Alfalfa-....E. F. Price
Harrow, Drum....S. B. Clardy
Harrow-tooth fastener....E. M. Rich
Harrows, Connecting-bar for....G. Anderson
Harvester, Corn-....J. W. From
Harvesting potatoes, onions, &c., Apparatus for..W. J. Dunham and E. W. Peck
Hat-guard....M. R. and M. J. Soden
Hat retaining and ventilating means..R. D. Baker
Hatchet, Folding pocket-....H. McNally
Head-rest....F. Corkins
Heel-counters, &c., Machine for making skived blanks for....L. L. Hartwell
Hinge....D. Wilde
Hinge....J. Flindall
Hinge-hanger....G. E. Leverton
Hoisting device....H. A. Myers
Horse-power, Meter for indicating...W. E. Burt
Horses' knees, Dressing-retainer and shield for....J. Douglas
Horseshoe-making machine....R. S. Matteson
Hose or pipe coupling....C. E. Atkinson
Hose-supporter and protector, Combined....V. Robbins
Hot-air furnace....W. Miller
Hub, Variable-speed coasting and braking....A. F. Rockwell
Humidifier....F. B. Comins
Hydrocarbon-burner....J. A. Hunt
Ice-cream freezer....A. E. Hopley
Igniting device, Electric..J. A. and B. A. Jeffery
Indurated product and preparing same....L. H. Baekeland
Ink-distributer for platen-presses..A. E. Berreyesa
Inking apparatus....H. F. Bechman
Insect-trap....R. Hazelrigg
Insulating-support for high-tension conductors...R. D. Mershon
Internal-combustion engine....E. Higgins
Internal-combustion engine....C. G. Wridgway
Internal-combustion engine....C. G. Weld
Internal-combustion engine....H. L. Jones
Iron heated by electricity....J. Collicott
Iron-heater, Portable....E. C. Thompson
Ironing-table, Folding....J. H. Hummer
Jack-screw, Shifting....S. M. Dunlap
Jar and bottle closure....E. Hoffman
Jar-holder....J. Twohig
Joint-fastener....M. W. Wintermute
Journal-bearing for revoluble disks, Dust-proof...P. Broman
Key-fastener....P. J. Ryan
Keyhole-plug and guard therefor...C. S. Batdorf
Knob, Adjustable door-....R. C. Walter
Label-holder....E. J. Middleton
Ladder....J. Vaghi
Lamp....H. Salsbury
Lamp....E. E. Allbee
Lamp, Flaming arc-....G. L. Martin and A. W. Schreiner
Lamp-holding device, Plural-, 2 patents....R. B. Benjamin
Lamp, Miner's....R. L. Graves
Lamp-socket, Plural....R. B. Benjamin
Lamps or headlights, Mechanism for vehicle....A. P. Prendergast
Last....W. S. Hamm
Lathes, Stop-motion for veneer-....J. M. Rounds
Laundried articles, Carton or holder for....N. J. Goodman
Lavatory-fitting, 2 patents....P. Mueller
Leg-fastening....G. W. Franzheim
Limbs, Joint for artificial....F. W. Merrick
Line-casting machine....J. R. Rogers
Line-casting machine....F. B. Converse
Line-casting machine (reissue)..F. C. L. d'Aix
Liquid dispensing apparatus....H. S. Cornish
Lock-indicator....A. Arens and E. L. Teich
Locomotive ash-pan....T. W. Anderson
Locomotive ash-pans, Device for cleaning..N. Olson
Locomotives, &c., Arch for fire-boxes of..J. Loftus
Loom-dobby..T. Haworth, J. Briggs, and W. Ayrey
Loss-preventing device....W. K. Wolf
Lubricating draper-roller....J. D. Jones
Luggage-carrier....T. W. Tschiffely
Mail-bag-handling apparatus....H. N. Pedersen and P. M. Christensen
Mail-box support....A. P. Kersey
Mail-catcher, Railway....N. H. Campbell
Mail-exchanging device....H. Diefenbaugh
Mail-handling apparatus, Railway..N.H.Campbell
Mail-pouch catching and delivering apparatus....J. L. Ware
Mail-pouch-transferring apparatus..J. W. Pepple
Malt-stirrer....M. Kondolf
Massage apparatus....J. W. Jones
Massage device...H. Wiking and B. J. Bengtsson
Match-safe....C. E. Birky
Measurer, Skirt-....U. E. Morrison
Measuring appliance, Angle-....A. Konig
Measuring attachment for cloth-folding machines....K. von Thigpen
Measuring machine, Cloth-....C. H. Lantz
Meat-tenderer....W. H. Humeston
Metal, Forming expanded....W. H. Cooley
Metal pieces, Joining (reissue)...H. Goldschmidt
Metal rods or bars, Apparatus for use in twisting..L. Hartel and L. Kissling
Metallic tie....L. A. Emerley and F. Matschuk
Milk sampling and measuring device..A.A.Johnson
Milking cows....F. M. Berberich
Milking-machine....L. Burrell
Milling-machine, Portable....R. P. Decker
Mines, Conveyor for....P. J. Riley
Molding-machine....S. F. Nicolai
Mold, Machine for use in drawing patterns in....S. Strettles
Mop-wringer....M. E. Davis
Motor-controller....A. Kimble
Motor-controlling apparatus, Electric-, 3 patents..H. E. Dey
Motor-controlling device....T. E. Barnum
Motor starting device, Internal-combustion-....E. L. Sharpneck
Motors, Igniter for internal-combustion....H. A. Johnston
Motors, Method of and means for regulating the speed of electric....R. H. Rogers
Mowing-machine....M. Jewell
Music holder and turner....H. M. Masters
Music-leaf turner....R. A. Gibson
Music-record sheets, Apparatus for producing perforated....G. Machlet, Jr.
Musical instruments and other apparatus, Contact device for self-playing....G. H. Davis
Musical instruments, Water-key for..W. W. Allen
Note-sheets, Receiving-spool for..W. R. Crippen
Nut-lock....W. H. Beltz
Nut-lock....G. Bryar
Nut-locking expansion-bolt....C. D. Vernon and J. P. Morningstar
Optical-illusion apparatus....E. P. Hoyt
Ore-roasting pot....F. D. Baker
Ore-treating furnace....H. C. Bellinger
Ores, Securing the chloridization of..W. Koehler
Oven, Gas-range....W. J. Best
Ozone, Generating and storing....F. M. Ashley
Packing-pad....A. D. Alexander
Paper bags, Machinery or apparatus for forming or making....J., W. H., C. H. and A. Day
Paper bottle....R. Lundell
Paper-making machines, Beater-roll for....W. H. Rankin and C. P. Dederick
Paper-mills, Treating the spent liquor of..I. Kitsee
Paving composition....J. H. Amies
Paving purposes, Composition for....J. H. Amies
Pedal-folding apparatus....F. C. White
Pencil-holder....E. C. Reiter
Pencil-sharpener....A. Rydquist
Perforating and binding machines, Assembly-box for....C. F. McBee
Permutation-lock....G. H. Hamilton
Phenol and formaldehyde and making the same, Condensation product of....L. H. Baekeland
Phenol and formaldehyde, Making insoluble products of....L. H. Baekeland
Phonic apparatus....T. H. Macdonald
Phonograph....P. Weber
Picture mount, Movable-....H. O. Sauer
Pile....W. N. Louque
Pipe and rod threader....H. Gautschi
Pipe fitting, Soil-....F. B. Morton
Pipe or rod carrier....G. Holt
Pipe, Skelp-treating apparatus for lapweld....H. W. Hock
Pipes, Air-vessel for water-supply..K. Romstaedt
Pipes, Lining....J. O. Persons
Pipes with sand, Apparatus for filling metal....C. O. Sholz
Piston for hot-air engines....F. B. Hubbard
Planter....J. W. Trammell and H. H. Hammack
Planter and fertilizer-distributer, Combined seed-....E. P. and J. T. Patterson
Planter and marker, Corn-....A. W. Koage
Planter, Seed-....E. C. Fowler and T. E. Daly
Plastic material, Machine for forming....G. S. and P. H. A. Balsey
Plate dishing and flanging machine...C. Gabriel
Plated metal and making the same....J. Wilder
Pliers....H. F. Kellemen
Pliers....W. Cronk
Plow....J. T. Gantt
Pole-sleeve....C. B. Voynow
Post-office box....H. O. Haywood
Power device....W. H. H. Baker
Power-generating apparatus....C. J. Lake
Press for expressing fluids from solids....F. G. Wisclogel
Pressure generating and applying apparatus, Hydraulic-....J. W. Nelson
Pressure-regulator....G. W. Collin
Printing apparatus, Frame structure for blue-....R. Herman
Printing machinery (reissue)....J. A. J. Hayes
Printing-press paper-feed mechanism..J. E. Tucker
Printing-press rotary folder....W. H. De Bush
Printing-presses, Throw-off mechanism for the inking-rolls of rotary....L. A. Wheat
Program-holder, Detachable-leaf...F. E. Sauerwein, R. Zacharias, and C. E. Lewis
Program holder, Transparent theater-...F. E. Sauerwein, R. Zacharias, and C. E. Lewis
Projectiles, Attachment for....C. Davis
Propelling means, Vessel-....F. Fanning
Protractor and level....N. R. Thibert
Pulling-over machine....H. Walther
Pulverizing-machine....E. E. Wann
Pump....C. F. Preslar
Pump mechanism....M. B. Van Ness
Punch and shear....C. Peterson
Punching-machine, Hand....H. Siegrist
Punching-machine, Multiple....C. E. Macbeth
Puzzle....W. F. Bartsch
Quoin....E. J. Casey
Rack....G. H. McGregor and A. S. Rudland
Radiators, Pressing device for push-nipple....H. L. E. Peterson
Rail-clamp....D. S. Wert
Rail-controlling device, Switch-....W. F. Doner
Rail-joint....M. Barschall
Rail-joint....W. E. Ransom
Rail-joint....W. P. Perkins
Railway block-signaling system....J. Gaszper
Railway-carriage doors, Appliance for automatically and otherwise locking and unlocking....D. Andrews and C. Bickerton
Railway-crossing....I. O. Stant
Railway-crossing....W. C. Peters
Railway-gate....E. L. Kishpaugh
Railway-rail spike and chair....J. T. Nulty
Railway-signaling system, Automatic..G. H. Sloane
Railway-spike....R. L. Smith
Railway-switch....J. F. Ober
Railway switch, Automatic....F. Rexach y Torres and F. S. D. Pena y Martinez
Railway-tie....H. C. Krepps
Railway-tie....H. H.Ranje
Railway-tie, Metal-reinforced, 2 pats..J. F. Lahart
Railway-tie, Self-adjusting steel..A. J. Schneider
Railway-ties, &c., Composition for..J. Kirkham
Railway-track safety-block....L. F. Learman
Railways, Catenary suspension system for the trolley-wires of electric....K. von Kando
Razor-case....W. L. Clark
Reamer, Adjustable....R. W. Bailey
Receptacle closure, Fluid- (reissue)....A. and T. A. De Vilbiss
Reclining-chair....J. Flindall
Rectal apparatus....J. P. Sanborn
Record-tablet....G. A. Eliason
Refrigerating apparatus, 2 patents...J. Heinrich
Refrigerating machine....R. N. Dyer
Refrigerating-package....A. W. Folsom
Registering device (reissue)....R. Hunter
Relay....S. D. Field
Riveting machine....C. Greiner
Rivet-feeding device....J. E. Peters
Road-working machine....M. A. Popkess
Roasting-pan (reissue)....P. Scott
Rock elimination, Apparatus for waste-....H. L. Kramer
Rolling-mill transfer-table....C. L. Huston
Roof-ventilator....W. W. Birnstock
Roofing-package....F. C. Overbu:
Rotary engine....H. Roux
Rotary engine....W. W. Wheeler
Rotary motor and pump....J. R. Kinney
Rotary steam-engine....J. W. Johnson
Rotary steam-engine....W. E. Minue
Rule....C. E. Jewell and C. H. Westcott
Rule....W. L. Neeld
Running-gear....A. T. Newell
Sand and slime separator and classifier..C. Allen
Sanitary ware....J. J. Cosgrove
Sapphires and other precious stones, Machine for cupping....J. L. Wennstrom
Sash holder and lock....K. F. Deskins
Sash-holding device....O. M. Edwards
Saw-setting machine....A. C. Ambler
Saw-setting tool....J. L'hote
Saw wheel, Band-....C. A. Putnam
Scaffold....S. Pichler
Scale, Ice-box and refrigerator....D. G. and A. H. Sansbury
Scarf-pin safety attachment....F. S. Reynolds
Screens, Fly attachment for....E. White
Screw-cutting machine....R. C. Nugent
Screw-driver....B. Presson
Screw-driver and tweezers, Combined....A. Bjorn and C. E. Cashmore
Screw-driver, Spiral....J. A. Leland
Screw, Set-....A. Levedahl
Seal and spout for cans and other receptacles....H. A. Truesdale
Seal, Metallic, 2 patents....W. E. Elliott
Seal, Snap-....E. J. Brooks
Seal, Tag-attaching....E. J. Brooks
Seals, Packing and registering....W. E. Elliott
Sealing box-fasteners, Tool for....R. Schleicher
Seam-dampening machine, Turn-down-collar-....W. A. Zeidler
Seeder....C. W. Stark
Sewing-machine....W. A. Mack
Sewing-machine gage....N. Friedman
Sewing-material holder, Combination....R. A. Walker and J. V. Parrish
Shade bracket, Window-....C. W. Brown
Shade-holder....W. A. Painter
Shaft, Pneumatically-operated....P. J. Grebel
Sharpener for lawn-mowers....E. Merritt
Sharpener, Knife-....M. L. Hawks
Sharpening device, Razor-....J. J. Meehan
Shaving-appliance case....W. L. Clark
Sheet-feeding machine....H. K. King
Sheet-metal plates, Cutting disks from....D. P. Robinson
Sheet-registering mechanism....H. K. King
Shingle and making the same, Metallic....T. M. Lunan and A. C. Rantsch
Shingle-stamp and packer's recorder, Automatic..G. A. Ortwein
Shoe-nailing machine....V. Sandahl
Shuttle-operating mechanism....C. F. Arnold
Shuttle-threading device....J. Jordan
Sign manufacture, Triple-....T. P. Heinemann
Signal-controlling apparatus....W. M. Chapman
Signaling device, Mechanical code-..F. A. Meissner
Signaling system....F. E. Smith
Silo....G. Moeke
Silo....J. H. McCoy
Silo....W. R. Harrison and A. C. Jacoby
Sinker....G. W. Teasdale
Sintering apparatus....R. Palmer
Skate, Roller-....W. Lennox
Skate, Roller-....J. Nuttall
Skirt hanger and stretcher....W. J. Tetreault
Skirt-marker....S. E. C. Campbell
Sliding gate....J. M. Peterman
Smoke-preventer, Time-controlled....B. L. Ames
Smoke-washer....J. Altenhofen
Smoking-pipe....E. B. Whitney
Snap, Breast-strap....W. Sedlacek
Snatch-block....E. Martin
Snow-melter....C. L. Moore
Soap, Antiseptic....W. A. Beatty
Sock and garter, Combined....L. O. Gitchell
Socks, Excluder for elastic....F. W. Savage
Solder to rims of caps for cans, Machine for applying....R. Flannigan
Soldering-furnace....E. T. Burgess
Sole-pressing pad....H. A. Davenport
Solitaire-board....F. E. S. Smith
Spade or shovel blade....H. Dahlmann
Spear, punch, and bending machine, Combined....S. Takacs
Speed-changing mechanism....E. H. R. Barton
Speed-measuring machine....D. F. Comstock and H. T. Kalmus
Speed mechanism, Variable-....A. F. Rockwell
Speed-varying mechanism....A. C. Smith
Speedometer....W. R. Harris
Spike-puller....W. F. Scott
Spinning and like machinery, Thread-guide for cotton-....J. and E. Appleby
Spinning-mules, Reversing mechanism for the band-cylinders of....J. H. Ryalls
Spinning-spindle....J. V. Cunniff
Spring-wheel....A. Moore
Stamp-affixing machine....J. F. Monaghan
Stamps, Reversible ribbon-feed for dating-....B. B. Hill
Stanchion....F. G. and A. E. Harris
Stave-jointing machine....N. M. Taylor
Steel holding and packing means, Drill-....D. S. Waugh
Stirrup, Safety-....W. V. Johnston
Stock-releaser....L. F. Lemon and J. C. Stoops
Stoker, Mechanical....T. V. Elliott
Storage battery....D. P. Perry
Stove, Heating-....H. F. Arenberg
Strainer....M. C. White
Strainer, Liquid-....F. L. Williams
Street and road construction, Preparing mineral materials and the like for....J. H. Amies
Supplemental seat....A. Reinekc
Support and insulator....E. F. Lindsay
Supports, Adjusting device for....P. Colidge
Switch signaling and operating mechanism....W. R. Oyler
Swivel-hook....C. G. Theiling
Syringe, Irrigating-....W. S. Sawyer
Table attachment....J. A. Chow
Tack, Window-shade....L. B. Girard
Talking-machine sound-box....A. Fischer
Target-practice apparatus....H. H. Cummings
Telegraph, Automatic....L. M. Potts
Telegraph, Multiplex....S. D. Field
Telegraphic repeating apparatus....W. E. Athearn
Telegraphy, Duplex cable....I. Kitsee
Telegraphy, Electric....J. A. L. Dearlove
Telephone, Portable....O. L. Mulot
Telephone systems, Signaling apparatus for....R. C. Welty

Telescopic article.....W. J. Dunn
Thermostat.....J. F. Williams
Thread-board.....W. O. Aldrich
Threshing machine, Garbanzon-.....F. Garver
Tie and means for fastening rails thereon.....I. C. Catton
Tie-plate and rail-anticreeper, Combined.....M. S. Clarke
Tilling-machine.....G. Spalding
Tire.....B. F. Norcross
Tire.....J. C. Taylor
Tire.....W. R. and T. S. Stewart
Tire.....J. G. Maxwell
Tire, Automobile-.....I. B. Kempshall
Tire for vehicle-wheels, Cushion-.....J. H. Poole
Tire, Pneumatic.....P. G. Muenchinger
Tire-protector.....F. Vacher
Tire, Vehicle-wheel.....J. A. Boyajean
Tires, Metallic protector for pneumatic.....E. A. Hultberg
Tobacco, Aging and curing.....S.G.Martin, W. O. Bartholomew and E. Schaaf
Tobacco-cutting machine.....F. M. Beall and P. A. Parker
Tomatoes, Treating.....O. Schroen
Tongue-switch..J. B. Strong and J. D. McPherson
Tool.....D. C. Southworth
Tool-handle.....E. Kener, Jr.
Tools, Feed for pneumatic.....M. Hardsocg
Towing device.....C. W. Larson
Toy derrick.....M. T. C. Wing
Toy, Sounding.....J. Berg
Toy, Sounding.....W. Bartholomae
Track-sander.....P. J. Coady
Track-sander.....A. W. Ham
Traction-coupling.....M. Westra
Train-stop, Automatic.....W. J. Soseene
Tramway, Aerial.....H. S. Robinson
Tramway-switch.....N. Schwarz
Transfer-hanger.....T. E. and E. Hudson
Transferring material from a high to a lower level, apparatus for.....A. C. Johnston
Transportation system.....W. C. Carr
Trap.....G. W. Hess
Trolley-wheel.....H. L. Baylies
Trousers-support.....J. V. Backlund
Truck.....C. J. Ingard
Truck, Car-, 2 patents.....J. C. Barber
Truck-elevator, Inclined.....J. W. Reno
Truck, Railway-car.....C. F. Murray
Tube-cleaner, Rotary.....P. J. Darlington
Turbine.....S. T. Holly
Turbine Regulator.....S. T. Holly
Turpentine-cup, 2 patents.....E. A. McKoy
Turpentine-gathering apparatus...E. A. McKoy
Type-bar and typographic form...F. H. Richards
Type casting and composing machine.....O. V. Sigurdsson
Type-writer.....L. Hauerstein
Type-writer attachment.....W. M. Deeter
Type-writing machine.....A. G. Snyder
Type-writing machine.....A. W. Steiger
Type-writing machine.....J. Felbel
Type-writing machine.....E. E. Barney
Type-writing machine.....H. Crutchley
Type-writing machine.....J. H. Barr
Type-writing-machine clamp.....E. E. Barney
Type-writing-machine ribbon-reversing mechanism, Automatic.....G. M. Kitzmiller
Universal joint.....W. C. Lipe
Vacuum cleaning systems, Handpiece for.....C. R. Green
Valve.....F. M. Ashley
Valve.....F. N. Whitesell
Valve.....C. F. Fernald
Valve.....W. N. Long
Valve.....J. P. Lavigne
Valve, Dry.....F. A. Phelps
Valve for engines.....O. Pearson
Valve for steam-traps.....B. L. and G. H. Clover
Valve for train-brakes, Engineer's..W. K. Rankin
Valve-grinder.....I. C. Smith
Valve, Pressure-retaining.....R. W. Kelly
Valve, Quick-action triple.....D. S. Gilbert
Valve, Regulating-.....T. M. Wilkins
Valve, Safety gas-...F. Yockey and C. D. McLeod
Valve, Sillcock and other.....F. W. Carlson
Valve, Throttle-.....Z. Paul
Valves, Making records for setting slide-.....J. B. Michael
Vault-vestibule.....J. G. Giesting
Vehicle.....A. F. Rockwell
Vehicle-seats, Shifting-rail for.....A. E. Smith
Vending apparatus, Coin-controlled..M. J. Forth
Vending-machine.....F. M. Weber
Vending machine, Cigar-.....L. A. Vandiver
Vending machine, Stamp-.....J. R. Armington
Veneer-taping machine..N.Nystrom and L. Taxon
Vessels, Controlling device for filling G. Schollmeyer
Vessels, Controlling device for canal and river....E. O. Nikel
Vibrator.....A. J. Stecker
Waistband for garments, Adjustable.....M. S. Erlanger
Warning-signal and stopping device for the safe movement of public conveyances..W. Whitman
Warp-balling machine.....W. G. Denn
Warp-carriage.....H. D. Colman
Washboard.....D. C. Juleson
Washing-machine.....E. Ramthun and C. J. Gutekunst
Washing-machine.....J. Szava
Water-closet.....H. S. Rumsey
Water-gage.....R. H. Buckner
Water-gate.....J. H. Phipps
Water-tube boiler.....J. P. Sneddon
Water-wheel.....J. L. Beil
Weed-cutter and cultivator.....M. Pruyn
Welding device, Foot-power.....H. H. Garver and G. F. Bissell
Well-tube cutter.....J. F. Baker
Wells, Trip wall-packer for oil-.....W. Palm
Wheel.....C. C. Foss and C. L. White
Wheel-block.....A. J. A. Bennett
Wheel, pulley and the like.....P. Montupet
Wheel-scraper.....C. W. Stark
Whiffletree-hook.....R. F. Bloom
Whip-lock.....J. W. Robertson
Winding-indicator.....O. Ohlson
Window-cleaning apparatus.....C. E. Prickett
Window-grate, Adjustable.....S. Jablonovsky
Window lock and lift.....R. T. Axe
Window, Metallic.....T. Lee
Wire-bender.....L. D. Danforth
Wire-twister.....I. N. Morford
Wire-tying machine, Automatic....O. L. Bowers
Wire wall-pocket.....T. V. Cromwell
Wire-winding machines, Notching means for.....W. L. Wergin
Woods, Treatment of coniferous....W. H. Rowley
Woodworking-machines, Pressure device for.....C. G. Wilderson
Wrapping-machine.....A. M. Price
Wrapping-machine, Package-.....F. Giroud
Wrought articles, Making.....J. H. Dods

DESIGNS.

Bottle-cap.....H. A. Miner
Charm, pin, or similar article.....R. Leding
Emblem.....F. M. Grant
Emblem.....W. G. Lee and A. E. King
Fabric, Metal mesh.....F. J. Lightbody
Lamp-shade.....E. A. Gillinder
Lighting-fixture.....W. Tures
Receptacle, Hanging.....W. R. Noe
Slipper.....L. Merz

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MECHANICAL PATENTS.

Advertising apparatus.....J. V. Casey
Aerial elevator.....J. A. Scott
Aelria navigation.....J. Means
Agar-agar-cascara product.....A. Schmidt
Alarm apparatus.....F. P. Moyer
Alfalfa-cutter.....J. Jorgensen
Alloy for electrical resistance.....W. B. Driver
Alloys of copper, such as brass, Production of.....S. C. Peck and W. R. Hodgkinson
Alumino-silicate or artificial zeolite.....R. Gans
Ammonia, &c., Making and recovering.....W. J. Dunnachie
Amusement apparatus, Mechanical...W. Harling
Animal-trap.....N. E. Austin
Annealing flats.....F. H. Daniels
Annealing flats and other shapes....F. H. Daniels
Annealing flats and other shapes, Apparatus for, 2 patents.....F. H. Daniels
Apparel, Wearing-.....N. J. Roller
Automobile-gear..H. P. Dodge and C. M. Foster
Automobile-radiators, Section for....H. Kurtzner
Automobile safety device.....O. Karcher
Awning fixture.....J. W. Bancroft
Bag-fastener.....F. J. Brown
Bag-fastener.....C. J. Lysaght
Bag-machine.....W. Liddell
Baking-pan.....G. Mueller
Ball.....W. W. Wrather
Bangles, bracelets, and the like, Attachment for.....S. Mendel
Barn construction.....J. R. Buckwalter
Battery-element support.....C. B. Schoenmehl
Battery tank, Storage-.....T. A. Willard
Bearing, Roller-.....W. Vanmanen
Bearing, Roller-.....M. Schluss
Bed-bottom.....J. F. McClatchey
Bed, Obstetrical.....W. B. Peak
Beds, Safety-headboard for folding..J. H. Edmonds
Bedstead attachment.....C. D. Clark
Bedstead, Extension-.....H. B. Arnold
Bell, Door-.....F. Saxauer
Belt.....W. F. Lott
Berth for ships, Swinging.....V. Bridgman
Billiard-cue tip and fastener.....C. Marx
Binder, Loose-leaf.....J. L. McMillan and C. H. Joslyn
Binder, Loose-leaf.....J. M. Lull
Binder, Temporary, F. H. Curry and L. R. Coppage
Binding-machine.....C. F. McBee
Binding-nicking machine.....E. E. Sanborn
Biscuit-coating machine.....H. Tietjens
Blade-molding means.....F. Hodgkinson
Blade-mounting means.....J. E. Snyder
Blind-slat fastener.....J. B. Riley
Blowpipe.....E. Odam
Boat, Submarine, 2 patents.....R. D'Equevilley-Montjustin
Boats, Ship's-screw-driving mechanism for submarine.....W. Maier
Boiler-cleaning device.....A. Thomas and E. Thompson
Boiler-flue expander.....D. A. Lucas, G. D. DeLong and A. N. Lucas
Boiler-tube expander.....J. C. Tassey
Bolt-header.....J. R. Blakeslee
Book, Blank.....C. R. Fargo
Books and other articles, Support for..G. J. Keene
Boring-bar.....A. F. Liden
Bottle-cap.....G. L. Best
Bottle-closure.....A. Adelson
Bottle, Non-refillable..H.C.Anderson and F. S. Ash
Bottle, Non-refillable....J. Birner and E. J. Heil
Bottle, Non-refillable.....A. La Rose
Bowling-alley.....H. V. Keefer
Bowling-machine.....J. and J. A. Venn
Brake-beam.....C. F. Huntoon
Brake-beam hanger.....S. S. Underwood
Bread, &c., Machine for use in the manufacture o plain.....S. McConnell and J. E. Wilson
Bread-roll.....P. S. Wood
Brick-cutting machine.....W. R. Hasselback
Broiler.....M. M. Dresdner
Broom-bridle.....C. F. Schulz
Brush holder, Tooth-.....O. E. Jones
Buckle.....G. B. Adams
Building-block.....S. Butz
Building construction.....T. McFeely
Burglar-alarm and automatic camera, Combined..J. C. Ashe
Burglar-alarm screen.....P. Orance
Butter making and packaging apparatus.....J. De Lisle
Cabinet for drinking-cups, Sanitary..F. W. Farmer
Cabinet, Metallic.....G. Holden
Cableway.....T. S. Miller
Calculating-machine.....J. Bricken
Camera, Moving-picture.....H. Meredith-Jones
Can-lacquering machine.....F. W. Wild, Jr.
Can-marking machine.....J. B. Conover
Can-polishing machine.....C. Hediger
Cane-unloader.....C. Bosse
Capsule-forming apparatus.....B. W. Scott
Car.....F. A. Dahlin and E. Carlson
Car construction, Steel-.....W. P. Bettendorf
Car-coupling.....J. E. Hudler
Car-coupling.....J. F. and V. S. Durbin
Car-coupling, Automatic.....H. Leslie
Car-door bracket.....J. K. McGuire
Car door, Grain-.....W. H. Ascue
Car, Dumping-.....C. A. Lindstrom
Car-fender.....C. B. Albree
Car-fender.....J. Mylott
Car-loading machine, Box-.....A. J. Gurney
Car, Steel.....C. H. Anderson
Cars, Strengthening device for the ends of railway box-.....G. L. Weiss
Carbonating liquids.....J. Bienz
Carbureter.....J. C. Simonsen
Carbureter.....H. A. Miller
Carbureter....D. Fergusson and C. L. Sheppy
Card-case.....G. Jenner
Carpet-seams, Machine for removing nap from..S. Zwald
Carpet-stretcher.....G. L. Noll
Carriage foot-brake.....C. Strohkorb
Cart.....J. J. Devine
Caster-retaining socket.....D. A. Maccuaig
Casting metallic members.....H. M. Pflager
Casting operations, Means for preparing core-bars for the.....M. H. Fletcher
Cement surfaces and product, Treating Portland-..M. Toch
Centering-machine.....W. T. Ruth
Centrifugal regulator.....W. Jahns
Chandelier.....L. B. Hornbeck
Chart, Adjustable.....F. D. Webster
Check, Combination fluid and vacuum..H. T. Case
Chicken-separator.....E. Hill
Chocolate-composition coatings, Heating and storage system for.....C. J. Dionne
Chuck.....L. W. Holub
Chuck and tool-holder, Reversing-...M. N. Jarvis
Churn.....F. Peter
Churn-motor.....J. T. Walston
Clock, Eight-day alarm-.....P. Lux
Clothes-line support, Window-..T. A. Macdonald
Clothes-pin.....J. F. Norman
Clutch.....T. White
Cock, Angle-.....W. D. Kendrick
Cock, Blow-off.....J. B. Youngblood
Coffee-pot.....C. F. Blanke
Coffee-roasting.....E. and G. De Mattia
Coin-paying machine.....C. Menchen
Coking-furnace, 2 patents.....L. L. Summers
Collapsible tube.....R. Brooks
Columns, posts, and the like, Metal reinforcement for metal-reinforced.....G. J. Schade
Combination-wrench.....L. V. Aronson
Compostion of matter.....J. F. Norman
Composing-machine, Mechanical-controller.....W. G. White
Concrete column, post, and the like, Metal-reinforced-.....G. J. Schade
Concrete Construction, Metal reinforcement for Metal-reinforced.....W. S. Ferguson
Concrete reinforcing construction..J. W. Linzee, Jr.
Concrete tie and rail-fastening.....A. O. Coffin
Conduit-cap for electric installation..W. H. Vibber
Converter, Metallurgic.....W. H. Peirce
Conveyer, Endless-chain.....F. Merian
Conveyer, Mangle-.....R. M. Boyce
Copper matte, Bessemerizing of...E. A. C. Smith
Corn-husker.....D. H. Tree
Corn-shocking horse.....W. H. Rice
Corner beads or strips, Clip or anchor for.....A. P. Diescher
Coupling.....H. A. Tunis
Crate.....W. J. Puckett
Crate, Folding.....W. H. Drake
Crate, Knockdown.....H. E. Clement
Crate, Knockdown.....E. B. Weston
Crimping-machine..H. E. Dill and W. P. Marsh
Cue-tip trimmer.....P. Ansell
Cultivator attachment.....E. L. Ross
Cupboard and wardrobe, Knockdown.....J. H. Hiscock
Curtain and shade fixture, Combination..E. Gabel
Curtain-support.....E. F. Marceau
Cutter-head.....E. Harrold
Dental spittoon.....C. E. Ritchey
Desk, Knockdown.....J. W. Campbell
Diamonds from settings, Tool for removing.....O. M. Farrand
Digitalis extract.....R. Tambach
Dish, Vegetable-.....L. Schlesinger
Dish-washing machine.....W. J. Paul
Display-rack.....F. Jaques
Door-check.....A. Brown
Door check and closer.....J. A. Peterson
Door fastener, Sliding-.....F. J. S. Miely
Door-holder.....T. Draper
Door-lock.....F. Assmann
Door-stop.....C. W. Ellerbe
Door stop and holder.....D. A. Sox
Dough-rolling device..D. Krapf and J. F. Sachs
Draft-gear.....T. H. Symington
Driving mechanism, Variable-speed.....A. L. De Leeuw
Dust-collector.....O. M. Morse
Dust-removing apparatus, Wet separator for.....R. F. Diserens
Dye and making same, Red disazo..A. Schedler
Dye and making same. Red azo.....W. Konig
Dye, Mordant-dyeing azo.....H. Geldermann
Dyeing with gallicyanin dyestuffs, Vat-.....J. Bierer and H. Loretan
Dynamometer.....A. E. S. Craig
Ear-ring, 2 patents.....M. L. J. Girdany
Earthenware article.....E. C. Stover
Edge-setting machine.....F. H. Warren
Electric controller.....C. L. Taylor
Electric-controlling appartaus..W. Schwagermann
Electric furnace.....E.A.A.Gronwall, A.R.Lindblad, and O.Stalhane
Electric furnace.....C. E. Wilson
Electric heater.....R. Farren and C. T. Clark
Electric heater.....R. W. Brown
Electric-light socket.....R. A. Schoenberg
Electric-lighting attachment for burglar-alarm systems.....M. F. Juruick
Electric machine, Dynamo-.....J. B. Wiard
Electricmotor..L. A. McCoubrie and C. F. Raydure
Electric sockets to fixtures, Means for locking.....H. Hubbell
Electric switch.....M. Guett
Electric switch..H. J. Carrigan and A. J. Sangster
Electrical cableway system.....O. Adam
Electrical contact device.....J. M. Smith
Electricity-meter, Pendulum.....C. Fery
Elevator-cupboard.....C. H. Weller
Elevator safety device.....J. A. Miller
Elevator safety-gate mechanism..J. Cunningham
Elevator safety mechanisms, Gravity speed-governor for.....J. Cunningham
Elevators, Grain-spout for portable.....G. W. and C. D. Baier
Embalming instrument.....T. F. Riley
Engine combustion-chamber, Gas-.....O. Kraus
Engine reversing mechanism.....B. Breeck
Engine sparking device, Gas or oil..W. M. Stempel
Engine starting device, Internal-combustion-.....P. G. Caspian
Envelop.....E. Wachterma
Envelop.....E. Wachtermann
Envelop-opener.....H. A. Smith
Envelop, Safety-.....W. E. Fisher
Exercising or massage apparatus.....R. Reach
Explosive.....L. N. Bent and H. Talley
Explosives in wells, Apparatus for firing.....L. H. Broadwater
Extension-table.....C. S. Burton
Eyelets, Die for use in the manufacture of.....G. E. Warren
Eyelets, Making.....G. E. Warren
Fabric for beds, couches, &c.....C. H. Gail
Fabrics with fluids, Apparatus for treating.....E. Gminder
Faucet.....H. Forsman
Faucet.....A. Engel
Faucet or valve device for wash basins and the like.....T. A. Hasek
Fence machine, Slat-.....J. M. Denning
Fence-post.....W. B. Hughes
Fertilizer.....B. Reichelt
Fertilizer-distributer.....E. Dierks
Figure and skirt-stand, Lay.....J. F. Gems
Filter and strainer, Centrifugal pulp.....H. T. and A. M. Sedgley
Filter, Rain-spout.....J. E. Welling
Firearm.....T. C. Johnson
Firearm-sight.....J. M. Stephens
Firearms, Movement for.....H. B. Febiger
Fishing-bob.....F. F. Wooton
Fishing-float.....A. A. Owens
Flash-light apparatus.....J. A. Smith
Flight-extractor.....O. Soles
Flour-bin.....H. E. McClure
Flour-duster.....F. Treischman and G. Ringstad
Flour-shaker.....G. A. Hoop
Flue-cutter.....J. P. Sorensen
Flushing apparatus.....A. C. Snell
Flushing device.....C. H. Zwermann
Flushing device, Tank-.....W. W. Ellerbeck
Flying-machine.....T. F. Dunn
Footwear protecting device.....T. W. Tucker
Forging-machine back-stop...J. R. Blakeslee, Jr.
Fork and spoon holder.....W. W. Butler
Form, Garment-.....A. D. Smith
Form or center, Collapsible.....P. O. O'Connor
Frame-joint and soldering the same..L. B. Prahar
Funnel.....L. E. Edmunds
Furnace.....M. Kelly
Furnace construction, Blast-.....J. C. Barrett
Furnaces, Melting-hearth for electric induction-..C. Greenwald
Furnaces, Method of and apparatus for returning flue-dust to blast.....W. B. Hubbard
Furniture-joint.....P. G. Abrams
Fuse-adjusting machine.....W. Schwartz
Fuse-making machine.....C. E. Schmunk
Galvanizing apparatus.....A. Niedringhaus
Game.....P. V. Ericson
Game apparatus.....Z. D. Underhill
Game apparatus.....M. Maris
Game apparatus.....H. O. Schreiber and C. A. Geisz
Game-piece.....E. W. Ashenden
Garbage or refuse receptacle.....A. E. Lyman
Garment, Adjustable.....W. A. Dielhenn
Garment-hanger.....C. Cleft
Garment, Nether.....W. P. McQuillen
Garment-rack, Extension.....B. J. Buckingham
Garment-supporter clamp.....B. Lauckner
Gas apparatus.....A. P. Rickmire
Gas, Apparatus for the manufacture of producer-.....W. J. Crossley and T. Rigby
Gas-burners, Apparatus for electrically igniting..A. J. Hill and F. C. D. Mann
Gas for illuminating, heating, or power purposes, Manufacture of.....H. S. Elworthy
Gas-generator.....J. H. Jourdan
Gas generator, Hydrogen-.....G. F. Jaubert
Gas-producer valve.....B. M. Aslakson
Gases and separating smoke and dust therefrom, Apparatus for treating.....E. G. Knoepfel
Gases, Apparatus for disposing of noxious.....W. H. Sartain
Gases in the atmosphere, Apparatus for detecting and indicating.....T. Groesbeck
Gate.....E. E. Cannon
Gear, Friction draft-.....T. L. McKeen
Gearing.....A. E. Newton
Gearing, Change-speed.....L. W. Anderson and A. R. Murray
Gem-cutting machine.....C. G. Hull
Gold-saving machine.....J. Hamilton
Gold, Treating.....J. B. Rossman
Governor, Centrifugal.....C. P. Hall
Hair-straightener.....I. K. Shero
Harness.....G. A. Humason
Harrow.....J. C. Baumgarten
Harvesters, &c., Supporting and moving device for.....J. Macphail
Hasp-lock.....P. McMenamin
Hay-fork, Horse.....M. D. Main
Hay-gatherer.....N. Fryman
Hay-loader coupling.....W. T. Jones
Hay-rake, Self-dumping.....G. G. Lowry
Heat-retainer.....W. T. Converse
Heating apparatus, Gas-.....W. E. Lawson
Hinge holder, Detachable-.....C. E. Morrison
Hoof-parer.....P. Broadbooks
Hoop-beading machine.....E. E. Slick
Horseshoe.....H. J. Filliez
Hose-coupling.....C. E. Judkins
Hotbed.....G. H. Barbour
Hub-odometer.....H. P. C. Browne
Ice-cream-cone holder.....W. H. Haight
Ice-cutting machine.....I. G. Gillespie
Ice-making apparatus, Can-....C. D. Havenstrite
Indicator-coupling.....L. B. Van Hoven
Inhaling apparatus.....P. H. Cherry
Initiation device.....U. S. De Moulin
Insole.....O. F. Fogelsong
Internal-combustion engine....F. and E. Carter
Internal-combustion engine.....C. O. Hedstrom
Internal-combustion engine.....J. O. Heinze, Jr.
Internal-combustion engine.....I. Hovey
Internal-combustion engine, Double-acting.....H. O. Horner and J. P. Boyland
Invalid-handling device.....E. Cleaves
Iron and steel, Metallurgy of.....W. S. Simzson and H. Oviatt
Ironing-board.....L. Stowe
Jar or receptacle.....R. H. Wolff
Jewelry.....L. Adler
Keyless socket.....H. Hubbell
Knife.....T. C. Fradsham
Knitting-machine.....A. M. Pigeon
Lace and the like, Shoe-.....H. F. Schelling
Ladder, Extension step-.....N. Binger and E. F. Burgstaller
Lamp, Berth-....W. S. Hamm and T. A. Legge
Lamps, Carriage for electric.....R. S. Beard
Lamps, Pressure-controlling valve for automobile-.....F. C. Bargar

Land-drainer, Mechanical....J. Scott
Land-roller....W. J. Dunham
Lap-fastener....F. A. Boyer
Latch-loek for swinging-doors....R. Buetikofer and G. Hoffman
Latch, Night-....R. A. Chase
Laundry-marking machine....T. L. Taylor
Lavatory....W. Podmore
Lawn-sprinkler....C. Ballreich
Lens-drilling device....L. Wilhelm
Lenses for speetacles or eyeglasses, Manufacture of....H. Orford
Light-extinguisher....J. H. Burdock
Link, Detachable....J. Dufour
Liquid-fuel burner....A. E.Stevens
Liquid-indicator....E. E. Hans
Loader, Foldable....C. A. Radcliff
Lock, 2 patents....R. Schoell
Locking mechanism, Combination....H. Van Hoevenberg
Loom....L. H. Landry
Loom for weaving tufted fabric....H. Wyman
Loom harness-motion....D. D. Miller
Loom, Shuttle-changing....B. F. McGuinness
Loom-templet....L. H. Landry
Loom thread-guide....J. Robinson
Loom, Wire-fence....V. Hoxie
Looms, Pick-counter for....M. L. Stone
Looms, Tuft-yarn carrier for pile-fabric....C. C. Brinton
Magazine....F. Smithson
Magneto-motor....C. S. Kershner
Mail-bag catching and delivering apparatus....H. J. Hansen
Mail-carrier....W. T. Buck and G. C. Willis
Mail-eateher....A. M. Bridgewater
Mail-ehute....J. W. Cutler
Manifolding apparatus....A. Lewis
Mantle, Incandescent....T. Terrell
Marking-board, Upholstery-goods-....J. G. Hulse and A. F. Schramm
Match-boxes, Machine for pasting the inner boxes or slides of....C. S. Nyberg
Mateh-safe....E. and D. C. Pooler
Matrix-retainer....J. W. Ivory
Measuring device, Skirt-....C. W. Smith
Measuring granular materials, Device for....O. D. Havard
Mechanical movement....R. A. Schoenberg
Megaphone....H. Meredith-Jones
Merry-go-round....G. Schmid
Merry-go-round....J. and J. Setceka
Metal, Forming ribbed expanded....J. Kahn
Metal, Reclamation of purified....W. C. Hyzer
Metals, Protecting molten, 2 patents....W. S. Rockey and H. Eldridge
Mine-ventilating system....M. Ward
Mineral-classifying apparatus....R. H. Richards
Mirror, Hat-....C. L. Cruver
Moistener and sealer, Envelop....F. Roth
Moistening apparatus, Air-....W. H. Webb, W. G. Brettell, and A. J. Adamson
Molding-press....E. C. Williams
Motor control system, Electric-....A. C. Eastwood
Motor starting and stopping apparatus, Electric-....C. Spannagel
Motor starting-switch, Electric-....E. Garside
Mouth-brace....C. Mayer
Moving implement....J. H. Fichter
Mower-starting device....J. C. Oliva
Mowing-machine....W. Crain
Mowing-machine....C. H. Pelton
Muffler, Exhaust-....J. Boyle
Muffler, Exhaust-....C. L. Hensley
Musie-leaf turner....R. J. Trice
Musie-raek....R. W. Mills
Music-sheet guiding mechanism....T. P. Brown
Musical instrument, Pneumatic....T. P. Klugh
Nailing-machine....H. W. Morgan
Needle-feed mechanism....A. G. Fenn
Needle-guide....A. Leach
Nipple-flange....H. W. Reynolds and J. A. Smith
Nitrids, Producing....C. E. Acker
Numbering-machine....F. Wosinski
Oil-burning and steam-generating apparatus....J. W. Spurrier
Oil from wax, Process and apparatus for the extracting of....J. C. Kuebler
Ore-cooler....F. D. Baker
Ore-grinding machine....J. C. Tatman
Oven, Baker's....W. D. De Vaughn
Oven-door, 4 patents....E. H. Huenefeld
Overshoe-holder....H. G. F. Wessels and C. B. Ingraham
Oxygen with other gases, Process and apparatus for burning....A. R. Bullock
Paeking-ease....A. T. Kruse
Packing for piston-rods and the like....G. Huhn
Paeking for stuffing-boxes....G. Strance, R. S. Bull, and W. P. Norris
Paeking, Pneumatic....E. S. Johnson
Padlock....I. M. Bremer
Paper bag....J. Sofge
Paper-bag machine....W. Liddell
Paper-bag machine....W. C. Fuller
Paper box and making the same....B. S. Morgan
Paper-eutting machine....E. A. La Due
Paper holder....E. C. Smith
Paper-feed mechanism....P. J. Meah
Paper-feed maehanism....W. Benjaminovitsch
Paper-paekage closure....C. F. Jenkins
Paper receptacle....B. C. Cockrell
Paper-slitter....S. M. Langston
Paring machine....G.Jahansan
Paring machine, Vegetable-....H. Robinson
Peaeh pitter and slicer....W. I. Irwin
Peneil-sharpener....A. W. Gifford
Pereolator, Coffee-....C. C. Mowbray and W. F. Geist
Phonograph....H. S. Mills
Phonograph-horns, Means for supporting....H. H. Turner and H. M. R. Glover
Phonograph-records, Mandrel for....W. C. Runge
Photographie pietures, Projecting continuous....L. L. Thurstone
Picking-m tion....L. H. Landry
Pieture-frame....E. Oldenbusch
Pipe-eoupling....J. C. Yearke
Pipe-eoupling....G. H. Reynolds
Pipe-joint-molding apparatus....J. F. Milam
Pipe joint, Rotary stand-....W. S. Phelps
Pipes, Removable cap for....E. J. Carter and L. J. Houle
Plane, Combination woodworking-....M. L. Carter
Planer-tool....A. F. Liden
Planter, Corn-....E. H. Snyder
Planter valve mechanism, Corn-....F. P. Murphey
Planter, Valve mechanism for corn-....F. P. Murphey
Pliers....P. Broadbooks
Plow....C. W. and A. W. Landers
Plow....H. Moore
Plow....C. C. Whittington
Plow-point attachment....W. L. Camp
Plow, Reversible moldboard....J. W. Buchanan
Plow scraper, Reversible disk-....H. S. Austin
Pneumatie-despatch-tube system....F. H. Wolever
Post or telegraph and telephone pole....H. E. Atchison
Potato cutter, Seed-....L. F. Miller
Potato-digger....H. P. Stewart
Potato-sorter....W. Pertzsch
Power-transmission mechanism....E. E. Keller
Printing-machine....L. W. Southgate
Printing-press....G. E. Pancoast
Printing-press....W. F. S. Ferry
Printing-press brake....C. A. Wright
Printing-press ink-fountain....A. M. Cottrell
Propeller, Marine....D. Urch
Propeller, Vibrating....E. Hildebrandt
Pulp-digesters, Charging....E. F. Parker
Pulp-feed regulator....A. Schultz
Pulp, Machine for saving waste....E. F. Parker
Pulverizer, Land-....L. Traub
Pump attachment, Oil-....C. B. Aggas and J. E. Rabbitt
Pump, Double-acting....R. G. Holekamp
Pump, Governed....N. McCarty
Pump-rod coupling....C. L. Kenyon
Pump, Vacuum-....T. W. Lowden
Pumps, Automatic device for controlling the operation of....W. F. Otto
Pumps, Operating mechanism for double-acting....C. F. Preslar
Puzzle....J. F. Collins
Puzzle....A. Weigt
Rail-bonds, Manufacture of....G. A. Mead
Rail-chair....A. Wardle
Rail clamp, Guard-....M. Burpee
Rail-frog, Continuous....B. F. Suverkrup and W. O. Owens
Rail-joint....L. Deer and F. Smith
Rails, Step-joint for....J. H. Allen
Railway construction....E. D. McDonald
Railway-crossing gate....H. J. Richendrfer
Railway-crossing gate, Electrically-operated....T. Hummel
Railway-fastener, 2 patents....C. H. Cornell
Railway-fastening....C. H. Cornell
Railway lining-block....A. Barnhard
Railway-rail splice....I. N. Prenovich
Railway-rails, Nut-holder and joint-supporter for....G. W. Henry, Sr.
Railway-switch....F. Bayless
Railway-switch....P. E. Vail
Railway-switch....C. W. Reinoehl and B. L. Weaver
Railway switch mechanism....F. P. Perkins
Railway system, Electric-....G. H. Maire
Railway-tie....C. A. Reed
Railway-tie, 2 patents....H. L. Hollis
Railway-tie, Metal....L. J. Sparks
Railway-tie plate....T. A. J. Hendricks
Railways, Junction-signal for mining-....W. Kleman
Range-finders, Means for supporting and working heads of....A. Barr and W. Stroud
Razor-blade-stropping device....O. Kampfe
Razor-stropping device....C. F. Benedict
Refrigerating apparatus, Ammonia....T. C. McKee
Registers, Wall-frame for air-....R. C. Brown
Rein-holder....A. Bing
Rein-holder....H. Green
Resizer....F. W. Moore
Ribbon-feeding mechanism....R. B. Craig and A. Coffman
Rifle, rear sight....W. R. Hatfield
Road-bed-cutting apparatus (reissue)....L. D. Craig
Rock-crusher....E. S. Philips
Rolling-mill....H. Grey
Rope-coupling....W. Shufflebottom and T. Kenworthy
Rotary gasolene-engine....T. E. Braley
Ruling device....E. A. Auerbach
Sad-iron....J. Kadiera
Sad-iron....F. W. Emerson
Safe, Protecting-....F. C. Martin and J. W. Smith
Sardine-tins and the like, Key for removing lids from....W. A. Read and H. J. Miles
Sash and door check, Combined....G. F. Ehemann
Sash balance, Window-....W. B. and E. M. Greear and D. Cox
Sash-fastener....J. A. Dillow
Saw-blade....R. E. Martin
Sawmill stock-lifter....E. J. Gibson
Scaffold, Flying....H. Martens and W. Schulz
Scale....D. C. Stauffer
Seeding device, Combined disk and shoe....N. L. Heckman
Self-adjusting wrench....R. H. Anderson
Sewing-machine....C. F. and M. T. Goforth
Sewing-machine structure....V. Bloom
Shade-machine knife, Window-....E. O. Engberg
Shade-supporting device....E. H. Lunken
Shaft or pulley coupling....T. White
Shaft-reversing means....H. F. Seybert
Shaft-support....G. E. Stansbury and H. H. Hutchison
Sharpener, Knife-....B. F. Emery
Sheet-metal culvert, Corrugated....H. W. Harry
Sheet metal, Galvanizing....A. Niedringhaus
Sheet-metal-wiring machine....W. R. Magie
Shock-absorber....J. H. Friedenwald
Shock-deadener....A. Mayesky and H. Boileau
Shock-loader....J. B. Schuman
Shoe-tree (reissue)....A. H. Taft
Shoe-trimming machine....A. Vose
Sifter, Ash-....S. J. Phreaner
Sign, Electrically-illuminated....J. H. Goehst
Signal-light apparatus....G. Dalen
Signal system, Automatie....P. O. Adams
Signaling apparatus, Selective....O. M. Leich
Siphon for dispensing liquids....A. Kleinfeldt
Sled, Resilient....F. G. McPherson
Sled-runner....D. L. Blocher
Slime-separator, Centrifugal....O. M. Kuchs
Snow-sweeper....W. J. Cooke
Sockets, Detachable chain-guide for pull-....H. Hubbell
Sound-box....W. A. Chapman
Sound-reproducing-machine records, Manufacture of....R. L. Gibson
Sounds, Apparatus for receiving submarine....T. A. Garrett and W. Lucas
Spectacles, eyeglasses, and the like....S. S. Lawrence
Speed-changing mechanism, 4 patents....E. E. Keller
Spittoon....J. Escuder
Sprag remover and retainer....J. T. Harcarik
Spray-burner....A. Rohrbaeh, W. Dieckmann, A. Gribling, and L. Grote.
Spring-wheel....J. A. Dieterich
Square....T. C. Howland
Stair-tread....R. T. Kanski
Stall, Cow-....C. S. Torrey
Stamping devices, Cushioned support for....J. Dubisee
Staple forming and discharging mechanism, 3 patents....V. Hoxie
Staple-machine....J. Buckley
Steam-boiler....J. C. Parker
Steam-generator....B. F. Silliman
Steam-generator for submarine boats....R. D. Montjustin
Steam-generator, superheater, and feed-water heater....F. A. Haughton
Steel, Making....L. M. Atha
Steel, Refining....E. Humbert
Stool and foot-rest, Combined....M. L. Porter
Stool, Shoe-fitting....H. H. Kramer
Stop mechanism, Automatic....V. Hoxie
Storage-battery....L. H. Flanders
Stove, Pocket-....B. Scamardi
Stovepipe anchor....J. Murchie
Street-sweeper....J. R. Pollock
Stropping-machine....J. Lorenzen
Stuffing-box gland....F. Keeler
Suction apparatus....M. Lebenberg
Suit-case....B. F. Becker
Superheat-gage....T. M. Lothrop and G. D. Bradshaw
Superheater....F. D. Potter
Support of bracket....J. H. Cook
Surface-gage for parallel lining....C. O. Dost
Surgical forceps....E. Moraweck
Sweeping-machine....B. Nathan and G. Heuser
Switch-handle....C. Schuster
Swivel, Detachable....D. M. Carson and G. T. Gilkerson
Tapping and drilling tool....J. H. Dorman
Tar and debris trap....G. R. Evans
Tarsia-work, Manufacturing....F. Kohn
Teeth, Mounting for artificial....E. J. Greenfield
Telemeter....O. Eppenstein
Teleobjective....E. Wandersleb
Telephone-call-registering system....W. J. Kibbe
Telephone-currents, Method of and apparatus for repeating....P. A. Campbell
Telephone-dial, Illuminated....R. B. Hallock
Telephone-receiver support....W. J. Mogridge
Telephone-transmittermouthpiece....J. A. Jamieson
Tephone-transmitter, Sanitary....M. Y. Calcutt
Tempering-furnace, Electric.V. and V. E. Royle
Test-indicator....R. L. Smith
Textile machinery, Cloth-clamp for....T. W. France
Theodolite, &c....L. H. Cooke
Thiosalicylic compound and making same, 2 patents....E. Munch
Timing and ignition device....W. H. Saunders
Tin scraps and producing tin compounds, Detinning....O. K. Zwingenberger
Tire....P. W. Litchfield
Tire-armor....S. S. Childs
Tire, Automobile-....I. B. Kempshall
Tire, Automobile-....W. G. Dicker
Tire, Automobile-....C. E. W. Woodward
Tire, Elastic....A. Bonnaz
Tire, Pneumatic....A. F. Angelicola
Tire,Pneumatic....A. Latimer
Tire-protector....C. E. King
Tire-protector....J. Richardson
Tire-supporter....S. T. Coate and J. T. Saris
Tire, Vehicle-....T. H. Banks
Tire, Vehicle-....T. W. Lucke
Tire, Wheel-....H. L. McDuffee
Tires, Apparatus -or manufacturing wheel-....J. K. Williams
Tires, Woven wrapper for....J. Marcet y Mart
Toaster....H. P. Knoblock
Tool, Electrically-heated....G. E. Stevens
Tool-holder....A. F. Liden
Tool-holder....C. B. Wells
Tooth, Artificial....J. W. Ivory
Toy....P. Phillips, C. Dipierno, and S. Mongell
Toy....B. B., M. P., and A. S. Exline
Toy....J. G. Sinclair
Toy, Basket-ball....E. S. Staples
Toy, Mechanical....E. J. Pearce
Toy, Sounding....M. P., B. B., and A. S. Exline
Track-sander....H. Vissering
Track-sander....D. Tauriello
Transformer-furnace....E.A.A.Gronwall, A. R. Lindblad, and O. Stalhane
Transmission mechanism....E. Bonneau
Trestle, Folding....E. F. Whitehead
Triangles, Apparatus for solving spherical....W. French and C. W. Frederick
Truck, Hand-....G. D. Parker
Trunks, Skirt-supporting attachment for wardrobe-....A. M. Moorman
Truss-frames and the like, Cushioning device for....J. S. E. Freel
Turbine-blading....F. Hodgkinson
Turbine, Elastic-fluid....F. Hodgkinson
Turbine, Elastic-fluid....W. J. A. London
Turbine, Elastic-fluid....C. Roth
Turn-table....G. A. True
Turpentine-hack....N. B. Stone
Type-casting and composing machine.W. G. White
Type, plates, &c., Machine for sawing and trimming....G. H. Vining
Type-writer, Justifying....W. G. White
Type-writer keyboard....S. W. Rowell
Type-writer touch key-finder....G. A. Cage
Type-writing machine....T. J. Coo
Type-writing machine....H. G. McCool
Type-writing machine....H. S. McCormack
Typograph apparatus....C. F. Blacklidge
Umbrella and the like....A. Friedlaender
Universal-joint device....J. Simon
Vacuum-cleaner....J. N. Whitehouse
Vacuum cleaning apparatus....J. F. Lacock
Valve, Automatie air-brake retaining and release....D. F. Knerr
Valve, Automatic cut-off....J. Miller
Valve, Car-sprinkler....E. C. Perry
Valve, Check-....J. G. Parker
Valve, Drain-....E. S. Stotts
Valve, Regulating-....S. A. Palmer
Valves, Push-button mechanism for flush-....W. J. Frost
Vehiele attaehment for detaining draft-animals....C. Reiger
Vehicle-wheel....E. J. Selley
Vehicle-wheel....A. Graff
Vehicle-wheel, 2 patents....H. O. Peck
Vehicles, Gasolene-tank for motor-....R. Huff
Velvets and like pile fabrics, Machine for pegging....F. Shaw
Vending-maehine, Coin-controlled....A. Jacobs
Vending-machine coin-controlled meehanism....A. Jacobs
Vending-machine coin-switch, 2 patents....O. Oehring
Vending machine, Stamp-....C. W. Timmons
Vermin-destroying apparatus....L. Kreft
Vibrator....A. J. Stecker
Vote-registering machine, Automatic....E. Boggiano
Voting-machine....E. E. Wolf
Voting-machine....A. McKenzie
Voting-machine lock-out....L. T. Harkness
Vulcanizing-mold....J. K. Williams
Waffle maehine, Cone-....A. G. and M. Andalaft
Waffle-packing case, Cone-....A. G. and M. Andalaft
Wagon bolster, Log-....J. T. Warren
Washing, fruit-canning and cooking machine, Combined....M. W. Miracle
Washing-machine....G. A. Carlson
Washing-machine....E. C. Waring
Watch-guard....S. Rosofsky
Water-curb-box lid....J. J. Heimbuecher
Water electrolytically, Purifying....H. B. Hartman
Water-motor....W. J. White
Water-purifying apparatus, Electrolytic....H. B. Hartman
Water-tube boiler....E. W. Clark
Wave-breaker (reissue)....J. A. Rosvold
Weed-eradicating means....B. F. and J. A. Scott
Weighing apparatus, Automatic....A. Sonander
Weighing-machine, Automatic....P. Edtbauer
Welding apparatus, Electric chain-link-....C. L. Hoff
Welding compound....M. U. Schoop
Wheel-rim, Emergency....W. F. and R. L. Jenkins
Wheel rim, Vehicle-....P. W. Litchfield
Whip and robe lock, Combination....W. York
Windmill-power, System of utilization of....H. C. Busby
Window-bead fastener....C. Casselman
Window-fastener....N. Dion
Window-glasses, Safeguard for....E. B. Bave
Window-kitchen....A. Soper
Window-spring....J.Hagerty
Window, Swinging....C. Casselman
Wire, Barbed....V. Hoxie
Wire-chain-making machine....M. Fessler
Wire-package....H. W. Struss
Wire-staple forming and setting machine....W. C. Osterholm
Wood, &c., Machine for dressing and finishing, 2 patents....J. W. Schleicher
Woodworking-machine....E. P. Shank
Work box and stand....S. Pecoy
Wrench....C. E. Townsend
Wrench....S. A. Holman

DESIGNS.

Basin-supporting hracket....M. J. McNamara and F. E. Cantner
Book-cover....L. A. Cole
Bow....H. Feder
Flush-tank....B. O. Tilden
Fob....F. Erben
Glass receptacle....B. W. Jacobs
Hats, Quill-holder for ladies'....H. W. Schwalb
Lavatory-bowl....R. E. Crane
Plate or similar article....C. Ziegler
Spoons, forks, or similar articles, Handle for....C. Osborne
Stein....C. P. Nutter
Talking-machine-record cabinet....L. F. Geissler
Watch-dial....E. Hart

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MECHANICAL PATENTS.

Account-register, Revolvable....J. E. Benjamin
Adjustable chair....A. B. Diss
Advertising apparatus....W. J. Rider
Advertising device....W. F. Sweet
Advertising novelty....L. Feist
Advertising or display apparatus....A. Quentin
Agricultural purposes, Spiked roller for....R. Nacke
Air-brake-adjusting device for loaded and empty cars....A. L. Goodknight
Air-brake-apparatus cut-out or release....S. P. Cota
Air-brakes, Triple valve for....W. B. Mann
Air-cooling apparatus....J. E. Gloekler
Air-ship....A. Bratschie
Anemometer....C. M. Bernegau
Ankle-support....W. J. McLinden
Announcement-board....W. N. King
Apartment, Living....J. H. Edmonds
Apparel, Wearing....C. C. Collins
Automatic switch....J. W. Thompson
Automobile driving mechanism..3 pats....C. B. Hatfield, Jr
Automobile spring running-gear....C. P. Boomer
Automobiles and the like, Shock-absorber for....R. B. Ewart
Azimuth-indicator....I. N. Lewis
Baby-cloths, Receptacle for....C. Brewer
Bag-fastener....J. S. Isidor
Ball-marking device, Golf....W. T. West
Barrel, Metallic....A. T. Kruse
Barrel or keg....J. F. Craven
Battery elements, Coupling for....F. A. Decker
Bearing for furrow-opening disks..F. R. Packham
Bearing, Shaft....G. Kupfer
Bed and bedstead for the use of invalids....J. McKay
Bed-frame....F. G. Gale
Bedstead....F. G. Gale
Bedstead clothes-clamp....F. L. Taylor
Bending apparatus....F. Ditchfield
Binder, Loose-sheet....W. P. Pitt
Binder post, Loose-leaf....F. H. Crump
Bivalves, Preservation of....A. A. Freeman
Boat....W. f. Reed
Boiler furnace, Locomotive....F. F. Gaines
Boiler-plug....C. L. McVoy
Bolster....2 pats....C. A. Lindstrom
Bolsters and similar articles, Making....F. Ditchfield
Book-guard....J. B. Boatright
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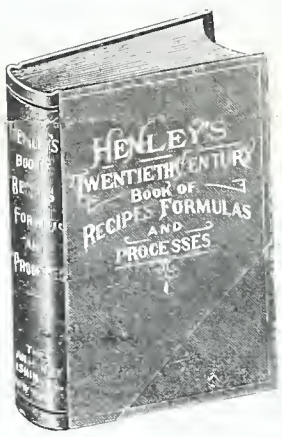

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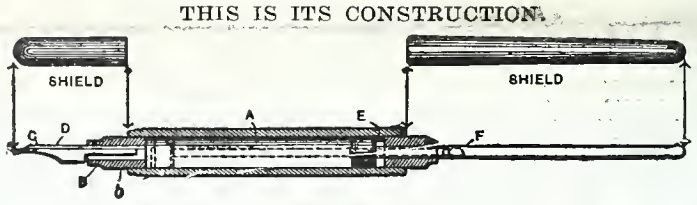

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SAFETY APPARATUS FOR MINES.

By C. VAN LANGENDONCK.

CONSIDERABLE attention has been given in European countries, in these last years, to the use in mines of apparatus intended to enable the wearer to penetrate into a dangerous atmosphere, that is to say into air which either contains insufficient oxygen to support life or which holds irritating vapors. King Edward VII, of Great Britain, appointed a commission to examine various forms of apparatus, and a rescue training school for familiarizing miners with the same (Fig. 1.) has been opened at Howe Bridge, near Atherton. Helmets of different kinds have been used in America for some years, but the types of rescue apparatus employed abroad have not been brought to this country to any great extent. The increasing number of dust and firedamp explosions, however, shows that there is a need for wider knowledge of such appliances.

The common object of all life saving or breathing devices, is, as above noted, to enable the wearer to remain in deadly air; and in principle this is attained by connecting the mouth with a closed tank into which oxygen is delivered and from which the carbonic acid is removed. As pointed out in a report by an English scientist, Dr. A. E. Boycott, of the Lister Institute of Preventive Medicine, the apparatus must be air-tight as far as the passage of air from the outside to the inside is concerned. In most conditions met with in mines, a very small leak does not necessarily render the apparatus useless. The outside air must not be breathed, either because it does not contain enough oxygen or because it is directly poisonous. In the former case a small leak is obviously immaterial: in the latter the occasional leakage of a few cubic inches of after damp (containing 1 or 2 per cent of carbon monoxide) into an air space of four or five quarts would cause no serious

FIG. 1.—LIFE SAVERS RESTORING A MAN OVERCOME BY FUMES.

FIG. 2.—DRAEGER-GUGLIELMINETTI APPARATUS WITH HELMET.

FIG. 3 —BACK VIEW OF APPARATUS WITH HELMET.

effects for many hours. If, however, irritating vapors, such as thick smoke, are present, even the smallest leak must be avoided.

The amount of oxygen required varies enormously with the degree of bodily activity, and to a less extent with the individual concerned. A man at rest uses about ½ of a quart per minute, while severe exertion raises the consumption to two quarts per minute; a degree of activity corresponding to walking three miles per hour requires rather more than one quart per minute. The volume of air breathed cannot be indefinitely increased, and the breathing of air which is deficient in oxygen is an imperfect stimulus to deeper or more frequent respiration. It is therefore necessary that the percentage of oxygen in the air breathed should be maintained as well as the total quantity available for use.

It is not desirable that the percentage of oxygen in the mixture breathed should fall much below that in the outside air (21 per cent), and it is definitely dangerous to breathe a mixture containing as little as 10 per cent of oxygen, especially while doing muscular work. There is no special physiological advantage in increasing the percentage of oxygen in the mixture breathed beyond 20 per cent.

The symptoms resulting from breathing air deficient in oxygen are insidious and indefinite, and vary very much with different individuals. The first obvious symptom, however, especially in persons not particularly directing their attention to the matter, may be sudden loss of consciousness. It is, therefore, absolutely necessary that some definite warning of the failure of oxygen, not dependent on personal vigilance or sensations of giddiness, and preferably of an emphatic mechanical kind, should be given to the wearer of the rescue apparatus before the percent-

age of oxygen has fallen to a dangerous limit. This is best obtained by arranging the apparatus so that it is filled with a mixture containing 60 or 70 per cent of oxygen. Before the oxygen percentage has been reduced to the limit of safety, the apparatus will become so empty and respiration so impeded that the attention of the wearer cannot fail to be mechanically attracted. Any apparatus which permits the user to unconsciously breathe a mixture containing less than 12 per cent of oxygen must be looked up as extremely dangerous. In all cases a moderately distensible bag is necessary to act as a reservoir and as a buffer or cushion for the ebb and flow of inspiration and expiration. Such a bag must be large enough, as expiration or inspiration against even the slightest pressure (as into a full or out of an empty bag) is extremely distressing, and not free from danger if persisted in.

The physiological effects of breathing air containing an excess of carbonic acid are usually obvious. Air containing 5 per cent causes definite panting, which at 6 or 7 per cent becomes painful; even at 4 per cent it produces unpleasant increase in respiration (hyperpnoea) and greatly reduces the capacity for doing hard work. It may be stated in a general way that 3 per cent is the maximum permissible, while it is desirable that the percentage should not rise much above 1 per cent. Definite symptoms of poisoning do not appear—at any rate in the course of a few minutes—until the percentage rises to 10 or 15.

At the end of such expiration the mouth and larger air passages are filled with the last and most impure air from the lungs; the air contained in this "dead space" between the lips and the lungs forms the first part of the succeeding inspiration. Any breathing apparatus attached to the mouth increases this "dead space" by the volumes of air between the lips and the purifiers or the inlet of pure air. In this way a large dead space may render the air actually breathed very impure, and this space in the respiration should not exceed one-fourth of a quart at the most.

The principle of construction of a modern rescue breathing apparatus consists in furnishing a means for purifying the air exhaled by the user by means of suitable chemicals, which absorb the carbonic acid and moisture breathed out. At the same time the oxygen consumed in breathing must be furnished from receptacles containing gas in a liquid or compressed state.

In order that the exhaled air may be freed from carbonic acid, it is passed through an anhydride whose action should be as rapid and complete as possible. The anhydride of soda or the anhydride of potash may be used, separately or together, in solution or in the solid state. Sometimes a mixture of the two alkalis is used, in order to simultaneously obtain energetic absorption and a moderate disengagement of the heat.

In order to furnish the means for carrying on the two operations of furnishing oxygen and purifying the exhaled air, considerable apparatus is necessary. The difficulty has been not to provide apparatus suitable for carrying on these operations, but to provide apparatus that would be light enough to be carried by a person, and compact enough not to interfere with the movements of the carrier.

Breathing apparatuses are classified under several types, and in this classification the method of supplying the oxygen is chiefly considered. The most common is the Drager-Guglielminetti apparatus, (Figs. 2 and 3) which is used on a large scale in Germany, France and England, and at the time of the memorable disaster of the Courriere Mines, was employed with success by the German life saving miners who went to help their unfortunate French brothers.

The cost of one of these apparatuses, ready for use, is about $90. They are of two kinds, with helmet, and with mouth-piece. With mouth-piece they are principally used for rapid work, while the helmet is preferred for longer and more dangerous tasks. The weight of the apparatus, with mouth piece, is 36 pounds, and with helmet 39 pounds, 33 pounds of which is carried on the back in both cases. Two oxygen cylinders are provided, their weight with fittings being 14 pounds. Each of the oxygen cylinders contains 9.33 cubic feet of oxygen. The expired air is drawn through the potash purifiers. With the expiratory tube from the helmet open to the air, 5 gallons of air and oxygen can be delivered through the inspiratory tube per minute.

Rubber Leather.

A new form of leather for which it is believed a great future exists is being placed on the market. It consists of leather which has been submitted to a tanning process of the chrome variety. A rubber solution is then worked into the interstices, rendering the hide thoroughly waterproof. The elasticity of the rubber permits of perfect flexibility and extraordinary toughness of the skin. It is impossible to forecast the many ways in which this process may be available. Tests have been made for motor tires, soles for shoes, pump washers, etc., and it is probable that the multitude of articles that can be made of rubberized leather will in time create a further demand for rubber. This new material will be especially useful for cycle tires, as it is almost impossible to puncture it, while it is said to be much more resilient and weather proof than ordinary leather.

Painting by Compressed Air.

All the first class car shops now have as an indispensable part of their equipment an apparatus for painting by the aid of compressed air. The machine works somewhat after the manner of an ordinary water hose, the paint being sprayed on the desired surface. It is extremely rapid in operation, and is said to be entirely effective for tanks and warehouses, as well as for the outside of bridges and similar work, where economy has dictated its employment.

TYPEWRITERS IN ASIA.

The contrast between the past and the present is vividly illustrated in the cut given herewith, showing a scene in Central Asia. Tartary and Turkistan are names familiar to us from our school geographies, but that is about as near as the ordinary man gets to them in after life. To nearly all of us, the regions of Central Asia are as a closed book. If there is any land of mystery left on the inhabited globe today, it is that great "roof of the world," enclosed by earth crowning and almost impassible mountains, lying north of the Himalayas and east of the Pamirs.

But even into these inaccessible stretches, where civilization in this twentieth century is much what it was in the days of the Old Testament, American enterprise and American machinery are finding their way. The indomitable Yankee drummer has rushed in where other travellers hesitate to tread. He cannot be said to be a familiar figure, as yet, in Tibet, but his influence has been felt in Turkistan. The rulers of the semi-barbaric states that make up this country of lost borders, the legitimate successors of Tamerlane, feel the joy of children in mechanical novelties. It pleases the Rajah to be photographed on his jewel-decked elephant; and the snap-shots of his scimitar-armed attendants might serve as appropriate illustrations for the pages of the Arabian Nights. The kodak is a delightful toy to these wealthy rulers; and the music of the graphophone offers a grateful change from the singing of the bulbul. The letter writer who sits in a corner of the bazaar, ready to render his services to all who may need them, is beginning to transcribe his letters on the typewriter. The illustration shows a town where little progress has been made since the calendar was changed. The shops, with signs painted to advertise the wares for sale—for the benefit of those who cannot read—the clothing of the people, the means of transportation, are about the same as they were over 2000 years ago. Camels, still the beasts of burden, as when Joseph was carried by the caravan into Egypt, are being loaded for a journey. Silk and cotton goods, brass work and rugs, tea and spices are strapped to their backs, to be slowly and laboriously conveyed across the deserts and steppes to the point of destination. By what seems an anachronism, a typewriter is being placed on one of these "ships of the desert," as shown in the cut. The writing machines in use in these regions have of course the kind of type that the people understand. The difficult Russian characters are common. Russia controls one province of Turkistan, and many of these time-savers are purchased for use in railway and telegraph offices. The Russian merchants also like them. Another field is opened by the advent of the machine in Arabic characters, one of which has been bought by the Emir of Bokhara. It is interesting to note that Japanese machines have also been made, but the Chinese language offers such obstacles that it is doubtful if the world will ever see a typewriter in that language.

THE AMERICAN TYPEWRITER IN TASHKENT.

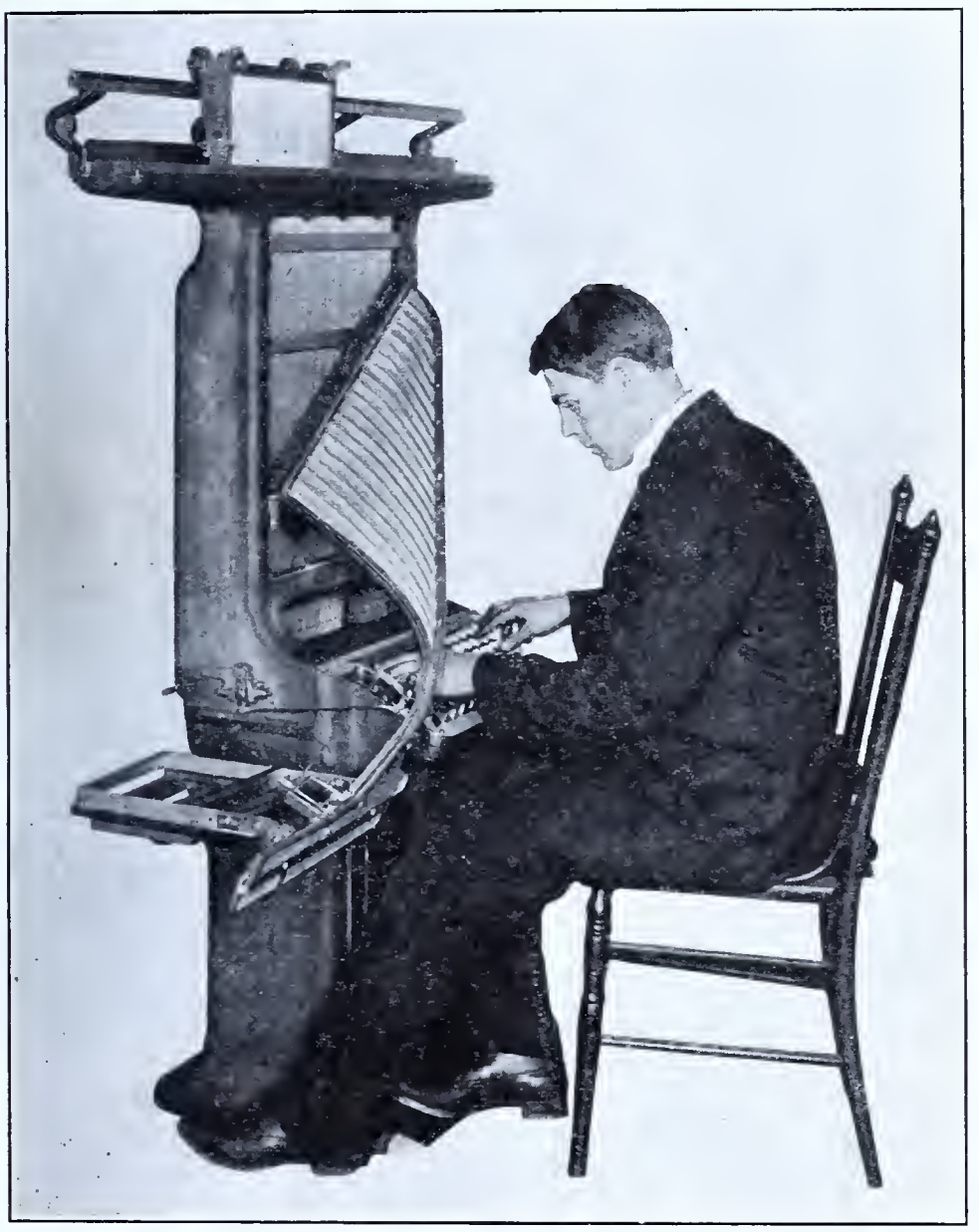
How to Get Copies of Patents.

THE INVENTIVE AGE prints each month a list of the patents granted by the Patent Office. This list includes the name of the inventor, the title of the invention and the date of the patent. Anyone can procure through THE INVENTIVE AGE a copy of any patent included in the list, by giving the data and enclosing ten cents in stamps for each copy. There is no better way of keeping yourself informed about the progress of the arts, than by scanning the list each month and ordering copies of patents.

A NOVEL UNIVERSAL TYPE SETTING MACHINE.

THE accompanying illustration shows a new type setting machine, which is said to have many advantages over previous machines of this class as it requires no power and no heat, and operates with facility without breaking the type. It is held that the transposition of the characters is impossible and the distribution is automatic. With this type of machine it will be noted that very little space is required, and no belt or shafting is necessary, as no power is used.

The type setting machine comprises 90 channels, each designed to hold characters used in printing. These channels are just large enough to permit all the type to pass freely, and not large enough to allow any letter to tip over. The channels are constructed separately, so that one may be removed instantly without disturbing any of the others. The channel at the extreme right is only 8 inches long and each channel as we progress to the left is one-eighth of an inch longer than the one immediately preceeding it. The tops being level, the bottom forms an inclined plane, maintaining an angle of about 45 degrees. These channels rest on a base and form the magazine. Inside of each channel at the top are steel strips which extend about one-third of the way across. The strips are called "wards," as they correspond to the wards of a lock.



Each type character has nicks which correspond to the wards in one of the channels, thus making it impossible for a type to enter any channel other than the one in which it belongs. One of the wards in each channel extends the full length, being cut off just far enough above the bottom to allow the bottom type to be pushed out when the corresponding key is pressed.

It will be seen that on the top of the magazine is another set of channels, similar in form to those below except that there are no wards in them. The partitions correspond in thickness to the partitions in the magazine below. This section travels over the channels in the lower magazine, the movement being automatic. As the upper section proceeds to the right, the bottom letter in each of the upper channels is tested on the wards of the lower channels and every type with nicks matching the wards in the channel directly beneath it will drop, while those type which do not match will be carried on the tops of the wards and the partitions to the next channel, where they will be again tested, continuing thus until they have been tested on all the channels, and consequently dropped.

It will be noted that the keyboard has a gentle slope upwards to the back, and the letters are arranged so that the characters which are most frequently used together are conveniently located, thereby permitting greater speed in operation.

Each key is attached to a key bar pivoted near its center and connected at its opposite end with a bar which operates as a small bell crank. A plunger operated by the bell crank forces the bottom type in the channel out onto an inclined plane, whence the type is carried by gravity to the assembling point.

It may be stated that this inclined plane is triangular in form, one of the sides conforming to the bases of the channels and therefore inclining to the left at an angle of 45 degrees. The longest side of the plate forms the runway for the type, conveying them to the assembling point. The plate also has a slope forward of about 30 degrees, and thus each letter or character travels on a slightly varying angle. As each letter has a different distance to travel to reach the assembling point, and the greater the distance the greater the angle, disarrangement of the characters in the runway is almost impossible, regardless of the speed of the operator.

When the character reaches the lower left hand corner of the plates it enters a small compartment at the angle of the runway, and is placed directly on its base by a lever actuated by the key. This movement is positive and accurate.

There is on each plunger a lug, and a rod is hung so that every time any key is pressed, this rod is engaged by the lug and the distributor moved one space to the right. This is accomplished by an escapement device which has been tested and found to work accurately. When a key is pressed the letter is forced out of the channel onto the triangular plate, and slides down to the assembling point; the distributing section is moved one point to the right and the letter is straightened into an upright position and advanced its width in the runway, to make room for the next character to be set.

As heretofore mentioned, no power is necessary for this machine; every movement is effected direct from the key, and every one is positive. It is said that this machine weighs only about 125 pounds, and as it does not need to be fastened to any power mechanism, it may be placed where most convenient to the operator.

It is claimed that by one set of keys, two operations are accomplisbed at the same time. Dead type is being distributed and at the same time new matter is being set, and entirely without attention from the operator. While the latter is taking type from the bottom of the channels, a fresh supply is constantly being placed in the tops of the channels by the distributing section.

To keep themselves posted in the progress of the arts in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and tbe character of the publication entitle it to the support of all the inventors of the country.

The Kleptograph.

As may be inferred from the name this is a machine to record thefts. It not only takes a picture of the thief, but accurately registers the hour of his visit. The room to be protected by the apparatus, says the *Technical World*, contains a system of wires and contacts that are properly distributed over the windows, doors, safes, etc., being connected with all objects of value. As soon as the stranger penetrates the room, a camera, under the action of some contact, unconsciously touched by the person, turns automatically toward the contact, or toward the thief, and after having opened the objective shutter, ignites the magnesium powder intended to supply the flash light. The camera further works to close the shutter, exchange the film, get a new portion of powder ready, and register the exact hour. All of these operations are performed so rapidly that the apparatus is ready to take another view by the time the intruder touches another contact, and so on. Like an invisible detective, the kleptograph follows any motions of the thief, in order to prepare a set of authentic and irrefutable documents to assist the police in their search for the criminal. The current required for working the apparatus is either half that of an ordinary battery or—after due reduction through proper resistances—the current derived from the electric mains. Being enclosed in a box entirely hidden from the burglar, the kleptograph cannot possibly be harmed by the latter.

New Material for Paving.

A recent French invention in paving consists in embedding in concrete fine iron shavings, or iron excelsior. The shavings ordinarily come in sheets or masses, which can be broken apart with difficulty, owing to the intertwining of the filaments, and which are somewhat elastic. In constructing paving blocks, a mold is filled with these iron shavings and the interstices filled with cement grout sufficiently fluid to penetrate the entire mass. The blocks thus formed are said to possess great strength and resistance to abrasion and also (which seems less credible) elasticity under blows. According to the *Cement Age*, tests made with such blocks are said to have shown a resistance compression of about 150,000 pounds to the square inch, and a tensile strength four times that of neat cement. One advantage claimed for this paving is that joints may be almost eliminated, thus doing away with the points where greatest destruction generally occurs. Nothing is said of the opinion which would probably be entertained of this pavement by the contractor who might be required to cut a trench through it. The cost of construction is said to be the same as that of ordinary macadam, but this would depend largely upon the cost of the iron excelsior.

THE AURISTOPHONE.

An appliance to aid the hearing, under the name of the Auristophone, has been put on the market. It has been called the modern speaking tube. as it gives the listener the full, clear and natural sound of the speaker's voice, free from roaring and with an actually beneficial effect on the organs of hearing. Its audibility is not impaired by punctured eardrums.

It is not generally realized that about 50 per cent of the inhabitants of the globe have defective hearing. The fact that many of these people are unconscious of their affliction makes the need of relief none the less urgent. Any appliance to lessen the impediment and to improve the hearing meets with immediate and widespread demand. It is claimed, and proof is offered to back up the claim, that the Auristophone not only enables the deaf to hear, but that its steady use acts as a treatment to remedy the diseased condition. When employed as illustrated in the accompanying cuts (Figs. 1 and 2), the device not only gives pleasure to those deprived of this sense, but has a beneficial effect. When hygienic precautions are taken and the head well protected from draughts and colds, it will do away with the head noises and restore the hearing in perhaps one-third of all cases of catarrhal deafness. In other instances the trouble is alleviated.

FIG. 1.

The Auristophone earpiece is provided with radial kerfs (see illustration, Fig. 3) which allow the air to disperse freely and relieve compression on the inner organs of the ear. The sounds thus enter the ear without obstruction, serving to stimulate and permanently recall to activity the dormant organs of hearing. The device, in fact, has been termed a musical massage for the treatment of catarrhal deafness.

The latest forms of talking machines and phonographs are widely advertised, and sell at a high price, for the reason that the scratching of the needle and reproducer points, known as surface scratching, which has always been an objectionable feature in these devices, is now done away with. This is accomplished by "boxing." The same effect is produced in the Auristophone, which does not "box" the scratching, but omits it, and the appliance sells for about one one-hundredth part of the cost of the new Victrolas and Amberolas. As seen from the accompanying cut, the Auristophone fits over the ear and not into the ear. as in other devices of this character. The portable Auristophone, as shown in Figure 2, is light and easily carried in the pocket, ready for immediate application when desired. It is adaptable to a beautiful lorgnette handle or flexible headband, which make it ideal for continued conversations, while it may be said that for any sick room or hospital it is the best appliance ever produced, being also sanitary in this respect, that soap and water may be freely applied thereto from time to time for cleansing.

FIG. 2.

The H. G. Pape Electric & Manufacturing Co , of Buffalo, New York, which has placed on the market a variety of other novelties in the line of acoustics. manufactures ear caps as shown in Fig. 3, for telephone receivers. The cap has a concave surface on the inside, which focuses all of the sound waves through the central opening and prevents miniature echoes within the cap. Many users of the phone have had occasion to complain of these echoes, which blur the production of sound. This concentration of the sounds through the inner concavity into the auditory canal has a tendency to exercise the organs of hearing, which, in turn, causes the proper circulation of the blood in these organs, insuring a more healthy condition by keeping open the eustachian tube, that may through catarrh have become partially or totally clogged.

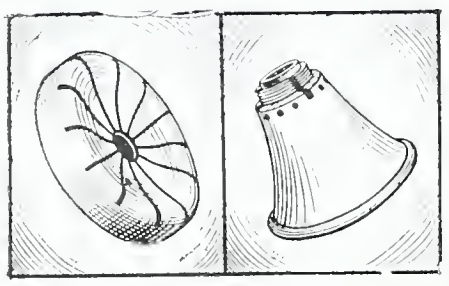


FIG. 3.

The mouth piece for the telephone, manufactured by the same concern, has similar elements of novelty. It does away with loud speaking, makes whispers distinctly audible, avoids the lodging of germs through hygienic construction, and improves the transmitter fully 100 per cent. As in other mouthpieces, it is provided with a web for the protection of the transmitter membrane, in the back of which is located the central sound chamber of the instrument. This sound chamber, however, has been provided with a series of radiating sound dissipating openings, passing through the side wall, thus preventing all muffling of the voice, as they give a free outlet to the waves after they have entered into the mouthpiece.

In order to insure perfect and distinct speech (which can only be had by confining the sound of the voice to the central part of the transmitter membrane), the threaded portion of the mouthpiece, which screws into the transmitter opening, is provided with an extension. This fits as close to the membrane as possible without touching, thus causing the fine articulation desired. The shape of the mouthpiece is that of a perfect recording funnel. The edge is curled (where the lips strike it), giving a smooth surface instead of a sharp edge.

These appliances are not made by a trust, but are manufactured by a concern which aims to make only a reasonable profit on its goods, so as to bring them within the reach of all who may be unfortunate enough to require such devices.

Inventors, Notice!

Mr. Thos. C. Hindman, of 700 Graceland Avenue, Chicago, Ill., a business man with some surplus capital, wants to buy all rights in a useful and unique invention of general demand, no matter whether already patented or not. He especially invites correspondence relative to a *practical*, non electrical, mechanical, automatic *burglar-alarm*, of the detonating or explosive type, adapted to the sides, tops or bottoms of windows. doors and transoms of residences or offices, or to the drawers of bureaus, writing-desks and the like. without requiring screws, nails or other fastenings that may mar or scratch fine wood-work. It must be durable, safe to handle and easy to set from either the outside or the inside of the door, drawer, etc.; simple in construction, to insure low cost of manufacture; of light weight, to minimize postage in mailing; convenient in size and shape for travelers to carry in the vest-pocket, and as nearly "fool proof" as possible.

New Mail Box.

A Dutchman with a well developed bump of distrust, has devised a mail box which can be emptied into the mail bag without the assistance of human hands. The carrier slips the sack, which is so constructed as to facilitate the operation, into grooves at the bottom of the box. This serves to fasten the bottom of the box and the top of the bag together, and both can then be drawn out, permitting the contents of the box to fall into the receptacle beneath. The carrier then returns the box bottom, with the sack top attached, into place; and this latter adjustment releases the bag, which may be removed. By a single movement of the hand, the box and bag are simultaneously closed. The carrier has no need of a key, for all is done automatically. Nor is it necessary for him to touch the letters or other articles of mail in the transit. The inventor believes the device will lessen the responsibility of employees and act as a precautionary measure against temptation. He does not explain how letters to be delivered are to be similarly safe-guarded. Possibly another and more trustworthy class of employees is to be called into requisition for this service. The invention has been patented in Germany, and is therefore practical, in all probability, for the German Patent Office is exacting in its requirements as to novelty, etc., before it grants protection. But either the standard of morality must be lower abroad than here, or this is one of the chimeras in which the inventor's brain is notoriously fertile. Considering the enormous number of letters handled in the world's postal service, the percentage lost is very small. These, it is found on investigation, consist to a large extent of misdirected and missent letters. Any dishonesty in the service is so rare as to constitute the proverbial exception. But the inventor shows himself to be a Doubting Thomas in other ways. He has had his device patented, it is true, but he declares that he has covered only the fundamental idea in the letters patent, and has kept secret the special locking device for the bottom of the box and the top of the bag. This is too valuable, it appears, to trust to the officials of the Patent Office. The man who tries to keep a device secret because he is afraid to patent it, ranks with the woman who thinks her stocking a safer depository for money than the bank.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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RAPP *v.* CENTRAL FIREPROOF DOOR & SASH CO.

(Circuit Court of Appeals, Second Circuit. December 15, 1909. 166 F. R., p. 430.)

PATENTS—INVENTION—FIREPROOF DOOR.

The Rapp patent, No. 653,400, for a fireproof door made of wood incased in metal, the only new feature of which is that both the wood and metal covering are paneled and more attractive in appearance than the doors of the prior art, is void for lack of invention.

GOSHEN RUBBER WORKS *v.* SINGLE TUBE AUTOMOBILE & BICYCLE TIRE CO.

(Circuit Court of Appeals, Seventh Circuit. October 20, 1908. 166 F. R., p. 431.)

1. PATENTS—LICENSE TO MANUFACTURE—INFRINGEMENT.

Where foods manufactured under a patent are sold by the patentee or licensee, the royalty having been previously paid or secured, the patentee cannot treat the seller or user as an infringer.

2. PATENTS—LICENSES—CONTRACT WITH LICENSEES—MODIFICATION.

An owner of certain patents relating to the manufacture of bicycle and automobile tires executed a license to manufacture and sell to various companies for the full unexpired patent term. Thereafter an agreement was made with the various licensees to secure the payment of royalty on tires to be subsequently made, by which the owner of the patent was enabled to ascertain the exact sales of tires made by each licensee, and the per centum of royalties secured by the agreement was rendered certain in amount. The agreement also provided for the services of an arbitrator, at the sole cost of the licensees, whose decision was made final. *Held*, that such agreement should be treated as a written modification of the license, and, being of benefit to the owner of the patent, was based on a sufficient consideration.

3. CONTRACTS—SALE OF PATENTED ARTICLES—CONTRACT WITH LICENSEES—VALIDITY—RESTRAINT OF TRADE.

Since the public, by licenses to manufacture patented automobile tires, only secured the right to purchase the tires after they have been manufactured and offered for sale, and has no right to have the competition between the different licensees continued, a modification of the licenses between the owner of the patent and the various licensees regulating the manufacture and sale of such tires was not objectionable as a restraint of trade, in violation of the Sherman anti-trust act (Act July 2, 1890, c. 647, 26 Stat. 209 [U. S. Comp. St. 1901, p. 3200]).

SIEBER & TRUSSELL MFG. CO. *v.* SAUGERTIES MFG. CO.

(Circuit Court of Appeals, Second Circuit. December 15, 1908. 166 F. R., p. 437.)

PATENTS—INFRINGEMENT—TEMPORARY BINDER.

The Trussell patent, No. 743,114, for a temporary binder, claims 1 to 6, narrowly construed, as required by the prior art and the proceedings in the Patent Office, have as an essential element of the combination a fixed pivot member on which the sheet-receiving prongs are mounted, and are not infringed by a device which does not contain such element.

MICA INSULATOR CO. *v.* COMMERCIAL MICA CO.

(Circuit Court of Appeals, Seventh Circuit. October 6, 1908. 166 F. R., p. 440.)

1. PATENTS—CONSTRUCTION—INTENTION OF INVENTOR.

A patent for a process of making mica insulating sheets by combining "laminated elementary scales" of mica should not be construed to require that the scales must be split down to the last possibility of splitting, but only so far as is commercially practicable, especially where it is plain, from the description of the process in the specification, that such was the inventor's meaning.

2. PATENTS—PROCESS—VALIDITY—ABANDONMENT OF APPLICATION FOR PRODUCT PATENT.

The abandonment of an application for a product patent, on a finding of an examiner in interference proceedings that the product had been in use for more than two years prior to the application, is not a conclusive admission that the process for the manufacture of such product for which the applicant had been granted a patent on an application filed at the same time, was old, nor does it estop the patentee from asserting the validity of such patent.

3. PATENTS—VALIDITY—INFRINGEMENT PROCESS FOR MAKING MICA SHEETS.

The Dyer patent, No. 283,646, for a process of making artificial mica sheets for electrical insulation, by uniting a series of layers of irregularly shaped mica scales, laid to overlap, by means of varnish and under pressure until the desired thickness is obtained, was not anticipated, and discloses invention; also *held* infringed.

FULLERTON WALNUT GROWERS' ASS'N. *v.* ANDERSON-BARNGROVER MFG. CO.

(Circuit Court of Appeals, Ninth Circuit. December 7, 1908. 166 F. R., p. 443.)

1. PATENTS—VALIDITY AND INFRINGEMENT—PROCESS OF BLEACHING NUTS.

The Farrell patent No. 663,069, for a process for bleaching nuts, having reference especially to English walnuts, which consists in dipping them in mixed solutions of chlorid of lime and sal-soda, to which at the time of dipping a weak acid is added, for the purpose of liberating free chlorin, was not anticipated, and discloses patentable invention. Nor is it void for lack of sufficient description of the process because it does not specify the proportions in which the two solutions are mixed, it being shown that no particular proportions are essential to the efficiency of the mixture. Also *held* infringed.

2. PATENTS—CLAIMS—SUFFICIENCY OF DESCRIPTION.

The specification in the claims of a patent for a process of a "weak acid" to be added to a solution does not render the patent void for uncertainty, where the specification names vinegar as a preferable acid, which for practical purposes indicates the standard of strength meant, although it does not limit the claims to the acid so specified, and they are infringed by the use of a dilute mineral acid.

3. PATENTS—CONSTRUCTION—PROCEEDINGS IN PATENT OFFICE—ESTOPPEL.

The claims of a patent which are not ambiguous are to be interpreted according to the meaning of their own terms, and are not controlled or limited by any argument or representation made by the patentee's attorney before the Patent Office as to the scope of the invention or the features in which it differs from the prior art, where no amendment of the claims was required or made.

4. PATENTS—CONSTRUCTION—INTENTION OF INVENTOR—"COINCIDENTLY."

A statement in a patent for a process for bleaching nuts that acid is added to the solution "coincidently" with the dipping of the nuts therein should be given a reasonable construction, and does not require that the acid should be added at the very instant of the dipping, but a successive dipping of different crates of nuts after the acid has been added and so long as it remains effective for the purpose used is fairly within the patented process.

5. PATENTS—SUITS FOR INFRINGEMENT—REFERENCE FOR ACCOUNTING—MASTER'S REPORT.

Every reasonable presumption is in favor of a master's report as to the profits made by an infringer of a patent, based on oral testimony, and it is not to be set aside or modified unless there clearly appears to have been error or mistake.

6. PATENTS—SUITS FOR INFRINGEMENT—PROFITS RECOVERABLE.

The advantage which a defendant derived from using complainant's patented invention over what he could derive from any other process or thing which was known prior to that invention constitutes the profits which the complainant is entitled to recover, where the amount can be ascertained with a reasonable degree of certainty.

7. PATENTS—SUITS FOR INFRINGEMENT—PERSONS LIABLE.

A corporation whose stockholders were growers of nuts, which received the product of such stockholders, treated and prepared the nuts for market, and sold the same, and after deducting expenses distributed the proceeds in the form of dividends, is liable for the infringement of a patent for a process which it used in treating such nuts.

VON EBERSTEIN *v.* CHAMBLISS.

(Circuit Court, S. D. Georgia, E. D. December 23, 1908. 166 F. R., p. 463.)

PATENTS—NOVELTY—PILE DRIVER.

The Von Eberstein patent No. 726,268, for improvements in pile drivers, which consist of mechanism by which a free movement is given to the leads or ways by reason of which piles may be driven within a considerable radius without moving the frame of the machine, and also either perpendicularly or obliquely, is void for lack of novelty, the essential features covered by the general language of the claims having been in prior use. If conceded validity, the patent *held* not infringed by the machine of defendant shown to have been in use prior to the date of the application for the patent. The relative mechanical features and improvements in pile driving machines discussed.

BLOUNT MFG. CO. *v.* YALE & TOWN MFG. CO.

(Circuit Court, D. Massachusetts. January 14, 1909. 166 F. R., p. 555.)

1. MONOPOLIES—CONTRACT IN RESTRAINT OF TRADE—PATENTED ARTICLES.

Where certain contracts between manufacturers of liquid door checks restrained each of the parties in the exercise of its rights under its own patents and in the sale of its articles made thereunder, the contracts were not rendered valid, though in restraint of interstate commerce, because they also authorized each of the parties to use patented inventions belonging to the others.

2. MONOPOLIES—PATENTED ARTICLES—LICENSE—SHERMAN ACT.

A sale or license of a patented article, with a covenant not to compete, made as an ordinary incident to enhance the value of the thing conveyed, was not within Sherman anti-trust act (Act Cong. July 2, 1890, c. 647, 26 Stat. 209 [U. S. Comp. St. 1901, p. 3200]).

3. PATENTS—RIGHT OF PATENTEE—USE—CONTRACTS.

While it is the ordinary privilege of the owner of a patent to use, or not, without question of motive, the grant of a patent confers on the patentee no right not to use his invention, or to agree not to do so, in restraint of trade in that article, except in connection with an assignment of the rights conferred by the latter's patent.

4. MONOPOLIES—CONTRACT IN RESTRAINT OF TRADE—PATENT ARTICLE—RESTRICTION OF USE.

Contracts between manufacturers of liquid door checks under various patents, by which each agreed to restrict its own trade in the article of his own invention, not as an incident to a grant of rights under patents, but to enhance the price by the removal of competition, and which constituted a general plan to regulate and control the business of dealing in such checks sold in interstate commerce, the plan comprehending the maintenance of price, the pooling of profits, the elimination of competition, and restraint of improvements, constituted a violation of the Sherman anti-trust act (Act Cong. July 2, 1890, c. 647, 26 Stat. 209 [U. S. Comp. St. 1901, p. 3200]), and were therefore unenforceable.

LEDERER *v.* SAAKE.

(Circuit Court, E. D. Pennsylvania. January 22, 1909. 166 F. R., p. 810.)

1. COPYRIGHTS—ACTION FOR INFRINGEMENT—BURDEN OF PROOF.

In an action for penalties for infringement of a copyright, the burden rests upon the plaintiff to prove title to the copyright by showing a strict compliance with every statutory requirement, as well as infringement; there being no grant, as in case of a patent, to raise a presumption of validity.

2. COPYRIGHTS—ACTION FOR INFRINGEMENT—DEFENSES.

In a suit for penalties for infringement of a copyrighted publication by the person in whose name the copyright was taken, the fact that he is not the author cannot be set up as a defense, it being immaterial to defendant whether plaintiff is in fact the owner or holds as trustee.

3. COPYRIGHTS—ACTION FOR INFRINGEMENT—WHO MAY MAINTAIN.

Where an American copyright of a German play was taken in the name of the author, a contract by which he granted the stage right to produce the play in the United States to another does not vest the latter with the right to sue in his own name for penalties for infringement of the copyright.

4. COPYRIGHTS—ACTION FOR INFRINGEMENT—EVIDENCE—PROOF OF DEPOSIT OF COPIES OF BOOK.

The certificate of the Librarian of Congress that two copies of a book were deposited with him is competent evidence of such fact in an action for penalties for infringement of the copyright of such book, and is sufficient where the identity of such copies with the book in suit is shown.

COMMERCIAL ACETYLENE CO. *v.* AVERY PORTABLE LIGHTING CO.

(Circuit Court, E. D. Wisconsin. January 13, 1909. 166 F. R., p. 907.)

1. PATENTS—SUBJECTS OF PATENT—COMPOUND PATENTABILITY—SCIENTIFIC DISCOVERIES.

The discovery that acetone used as a solvent for acetylene gas makes a solution having none of the explosive properties of either substance singly, and which may be safely handled and transported, when embodied in a device for utilizing the same, is patentable.

2. PATENTS—VALIDITY AND INFRINGEMENT—ACETYLENE GAS TANKS.

The Claude & Hess patent No.664,383, for an apparatus for storing acetylene gas, consisting essentially of a tank containing acetone as a solvent supersaturated with acetylene gas, was not anticipated and discloses invention, and is entitled to a fair range of equivalents in view of its undoubted utility. Also, *held* infringed.

3. PATENTS—APPLICATION—REQUISITES.

An applicant for a patent is not required in his application to elaborate the scientific theory underlying his invention.

NEW JERSEY PATENT CO. *et al. v.* MARTIN.

(Circuit Court, N. D. Iowa, C. D. February 3, 1909. 166 F. R., p. 1010.)

1. INJUNCTION—VIOLATION—CIVIL CONTEMPT.

Complainant cannot maintain proceedings for a civil contempt for the violation of an injunction until its rights have been determined on the merits.

2. INJUNCTION—CRIMINAL CONTEMPT.

Punishment imposed to uphold the authority of the court for disobedience of an injunction is for criminal contempt, and the penalty is for the benefit of the United States

3. CONTEMPT—HEARING—PROOF.

Where a conviction for contempt might subject the defendant to imprisonment, he should not be tried on ex parte affidavits, but on oral testimony taken before a special examiner, whether the contempt be civil or criminal.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

William Mebn, Corydon, Ky. Anti-rattler for Singletrees.—An object of this invention is to provide an anti-rattler for singletrees, designed for use on various kinds of one-horse vehicles, and adapted to permit the singletree to be screwed tightly against the cross bar of a pair of shafts, and capable, as the bearing or wear plates become worn, of automatically taking up tbe wear, and of holding the singletree firmly against tbe cross bar, whereby the singletree is prevented from rattling.

William T. Richards, inventor; Carl S Chamberlain, Charles D. Taylor, and John McCoach, Colorado City, Colorado, assignees. Quick-Action Triple Valve for Air Brakes.—An object of the present invention is to improve the construction of the Westinghouse and New York quick action triple valves, and to provide a device adapted to be readily applied to such triple valves without materially increasing the cost of the same, enabling the auxiliary reservoir to be charged in the shortest possible time, and thereby affording greater control and more rapid operation of the air brakes.

Eli Brumberg and Albert Resler, Montesano, Wash. Display Rack for Clothing.—An object of the present invention is to provide a display rack, designed for holding coats, vests and pants, and adapted to afford ready access to the same from either side of it. Another object of the invention is to provide a display rack, adapted to economize floor space, and having means for suspending or hanging the coats and vests of suits of clothing from its upper portion, and provided at its lower portion with shelves adapted to receive tbe trousers, and capable of being swung outwardly from either side of the display rack to permit the particular trousers of a suit to be selected without stooping beneath the coats and vests.

Albert Resler, Montesano, Wash. Show Case.—Tne present invention relates to a show case, more especially to means for mounting the shelves for displaying goods, and its principal object is to provide efficient means for enabling the shelves of a show case to be moved either backwardly or forwardly, whereby easy access may be had to any article within the show case without kneeling or stooping, and without liability of disarranging the contents of any shelf and of upsetting, breaking or otherwise injuring any of the articles displayed on the shelves.

Zachariah N. Seelye, Banks, Or. Saw Gage and Filing Tool.—An object of the present invention is to provide a saw gage and filing tool, adapted to bold a file firmly witb its engaging face at rigbt angles to the blade of a saw for jointing tbe teetb of the same. Another object of tbe invention is to provide a device, adapted to form an efficient gage for swaging the raker teeth, and provided witb means for enabling the teeth of a saw to be accurately dressed from the center or either end of tbe saw blade.

Henry G. Spraker, Rich Hill, Mo. Hame Fastener.—An object of this invention is to provide a bame fastener, designed according to the requirements of manufacturers of such goods so as to be produced at a minimum cost, and capable of fully meeting the requirements of the user of tbe same, tbereby insuring a ready sale of the device.

Thomas C. Thompson, Winchester, Tenn. Rein Support.—The principal object of the present invention is to provide a rein support, designed for use on various styles of one-horse vehicles, and adapted to hold the reins out of reach of the horse's tail, when it is lashing flies, or switched from any other cause. Another object of the invention is to provide a rein support, which will not be in the way when bitching or unhitching a horse, or in any manner interfere with such operations, and which will prevent the reins from dropping to the ground and getting under the feet of a horse.

Jacob M. Truby, Starke, Florida. Handles for Coffins.—This invention relates to handles for coffins, and one of its objects is to provide means for relieving the handle plate screws of strain, and of supporting the bottom of the coffin to prevent the same from becoming disconnected from the sides. Another object of the invention is to provide a handle adapted to support the bottom of the coffin in spaced relation with the bottom of the rough box, to enable the straps to be readily withdrawn, when the coffin is lowered into the grave, and capable of engaging the bottom of the rough box to prevent the latter from slipping during shipment.

Peter F. Wagner, inventor, Glenwood, Ind. Two patents. John W. White, Greensburg, Ind., assignee of the second patent.—The first patent covers a combined window shade and lace curtain hanger, adapted to enable window shades and lace curtain poles to be applied to windows with greater ease than heretofore, and having means for permitting the window sbade supporting means to be readily adjusted to accommodate window shades of different widths witbout retacking, or similarly fastening the parts at each adjustment of the same.

The second patent relates to drop lights and particularly to those adapted to be attached to a gas bracket or chandelier, and the principal object of the invention is to provide a drop light, capable of folding in order to arrange the burner thereof at any desired distance below tbe permanent gas bracket, or on a level with the same.

John T. Warren, Hempbill, Texas. Bolster for Log Wagons.—An object of the present invention is to produce a bolster, equipped with adjustable chocking devices, movable toward and from the center of the bolster to accommodate loads of different sizes, and adapted to be readily dropped below tbe upper face of tbe bolster to enable a wagon to be readily unloaded, and to prevent the said devices from being injured by the logs while unloading a wagon.

John J. Armstrong, Sr., Weimar, Tex. Combined Post Hole Digger and Wire Stretcher.—An object of the present invention is to produce in one tool a combined post hole digger and wire stretcber capable of enabling barbed wire to be advantageously bandled by one person in stretching and fastening tbe same to a fence post; and further to equip the tool with a blade wbich is adapted, when digging a post hole, to retain the earth and thereby enable the same to be removed from the post hole.

James G. Allen, Detroit, Mich., inventor; James F. Van Nest, Ubly, Mich., assignee. Puzzle Rolling Pin.—Tbis invention has for its object to provide a puzzle in the shape of a rolling pin, designed particularly for use as an advertising novelty, and adapted to afford considerable amusement, the device being equipped with a pin or handle member rotatable freely within the roller or body and retained therein by concealed locking devices, which are constructed to be thrown out of engagement with the pin tbrough centrifugal force, when the body of the rolling pin is rapidly rotated or spun by a cord or similar flexible means.

Carver W. Barber, Terry, Mont. Journal Box.—An object of the present invention is to provide a journal box, having a dust proof and oil tight lid, and provided witb means for locking the lid in its closed position and also for holding the lid open.

George C. Bourne, Worcester, Mass. Three patenfs.—The first patent relates to a hand grip for pistols, adapted to be applied to any type of pistol, so as to enable the same to be conveniently and properly grasped by the whole hand, without cramping the latter or producing any liability to slip.

The second patent covers a barrel grip for revolvers and other pistols, and the principal object of the invention is to provide a device capable of enabling the barrel of the pistol to be firmly gripped and securely held to prevent a short barrel pistol from either kicking upward or swerving laterally, whereby an easy aim and accurate shooting are secured.

It is the aim of the invention of the tbird patent to provide a combined grip and sight, designed for use on guns and rifles, especially 12, 14 and 16 gage shot guns, and capable of enabling a fire arm to be securely gripped by the left hand and firmly held against the shoulder, whereby the recoil of the fire arm may be controlled and more accurate aim secured.

Oliver Boyer, Spencerville, Ohio. Three patents.—The first patent covers a corn shocker, adapted to operate on a row of standing corn, and capable as it moves forward, of cutting tbe corn and of feeding the same rearwardly in an upright position, and of packing the corn in the form of a sbock in convenient position for enabling the latter to be readily tied up. Another object of the invention is to provide a corn shocker, which, after cutting the corn and arranging it in the form of a shock, will enable such shock to be readily deposited upon the ground at one side of the machine in an upright position.

The second patent relates to a self-regulating grain separator, equipped with an adjustable concave, in which tbe teeth or spikes may be set at the desired inclination to suit the character of the grain to be thrashed, and in which means will be provided for preventing the teeth or spikes from being broken should a solid object, such as a stone, or piece of metal from the binder, or the like get into the separator. Another object of the invention is to dispense with the cheat screen, or the very fine screen, which is usually employed in separators for removing the cheat seed and other wild seed, and which limits the capacity of a separator and results in cboking the same at intervals.

An object of the invention of the third patent is to provide a separator attachment for corn husking machines, adapted to operate on the fodder after the same leaves the husking and shredding mechanism, and capable of separating the husks and blades from the shredded stalks, and of discharging such husks and blades from a different point from the stalks. Another object of the invention is to provide means for separating the shelled corn from the fodder and for cleaning the corn before it is bagged.

Joseph A. Childress, Pilot, Va. Vegetable Fruit Slicer and Cutter.—An object of this invention is to provide a slicer and cutter, adapted to enable vegetables and fruit to be cut and sliced in a variety of ways, and capable of ready adjustment to cut the slices or pieces either thick or thin. Another object of the invention is to provide a reversible cutter carrying a pair of different blades, adapted to be instantly brought into position for use, so that fruit and vegetables may be cut and sliced in several ways without changing the cutter.

William L. Cooksey, Fort Worth, Texas. Trolley Wheel for Electric Cars.—This invention has for its object to provide a trolley, designed for use on electric cars, and having a high speed roller bearing trolley wheel, in which the speed of the moving parts at the center of the wheel will be reduced to a minimum to lessen the friction on the axle.

Edward A. Cleland, Lynchburg, Va. Two patents.—The first patent relates to a non-siphoning trap, designed for use in various kinds of plumbing, and adapted to effectually prevent siphonal action without employing the ordinary ventilating pipe, thereby greatly lessening the expense of installing it.

The second patent covers a pipe coupling, adapted to afford a safe, easy and adjustable connection between a waste pipe or vent and a basin or other plumbing fixture. The coupling is designed to be located at the floor, and is capable of vertical adjustment below the floor to accommodate the coupling to the position of the vent or waste pipe section; also of both vertical and lateral adjustment above the floor to avoid cutting the upper pipe section, and to enable the same to be arranged at a slight inclination when necessary.

Francis J. Donoughe, Gallitzin, Pa. Device for Handling Beer Kegs.—An object of this invention is to provide a device adapted to enable two kegs of beer to be conveniently carried in each hand without liability of the kegs swinging and striking the legs of the person carrying them; and also to construct the device so as to permit it to be employed for carrying a single keg, and to enable it to obtain a firm hold on the keg at the chine thereof.

Asa B. Fullerton, Letts, Iowa. Heating Drum.—This invention has for its object to provide a heating drum, adapted to be readily installed either in the room containing the stove to which it is connected, or in an overhead apartment, and capable of securing increased radiation of the heat and thereby lessening the consumption of fuel. A further object of the invention is to provide a heating drum, adapted to cause a positive circulation of air through it, and capable of taking cold air from the floor and discharging the same in a heated condition.

James D. Guilfoyle, Jacksonville, Fla., inventor; W. B. McGroarty, Charles L. Bagwell and Emmet B. Huff, same place, assignees. Safety Appliance for Railway Switches.—Heretofore numerous wrecks and other accidents have occurred at switches by reason of the movable switch rails not being in close contact with the adjacent rails, through the spreading of the latter and other causes, for when a movable switch rail does not fit closely against the adjacent rails, there is always a liability of the switch rails being split by the wheels of a train, which causes some of the wheels to follow the switch or sliding, while the other wheels of the train are following the main rails, whereby serious accidents and great damage ofttimes result. It is the aim of this invention to produce a safety appliance, capable of enabling a switch, when open, to be closed by an approaching train, and adapted to positively hold the movable switch rail, and to effectually prevent the wheels from striking and splitting the point of the switch rail.

NEW PATENTS FOR SALE.

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FOR SALE—Patent No. 939,246, dated Nov. 9, 1909. Whip Socket. Locks securely by downward pressure on whip handle. If interested write for copy of patent. Address, R. Habekost, Squirrel, Idaho. my

FOR SALE—U S Letters-Patent No. 935,391. Haying and Manure Loading Machinery. Three years test. Might consider royalty. Canadian patent pending. Write for particulars, John B. Mohan, R. F. D. No. 1, Effington, South Dakota. my

FOR SALE or Trade—Patent No. 922,740. Just put on the market. A money maker. Plenty of territory. Write for full particulars. Address, Wells & Meek, Lock Box 385, Kahoka, Mo. my

FOR SALE—Patent No. 943,495, dated Dec. 14, 1909; bolster for log wagons; has adjustable chocking device; will accommodate loads of different sizes; an invention of real merit. Address, John T. Warren, Hemphill, Texas. my

FOR SALE—U. S. Patent No. 937,631, Plumb Level. A very valuable invention. Fortunes in it. Will sell outright or part cash and royalty. Address at once, J. E. McMahal, Boulogne, Nassau Co., Florida. my

FOR SALE—U. S. Patent No. 938,530, issued Nov. 2. 1909. Punch. Will punch from the lightest tin plate to No. 20 gage iron, with one hand. For particulars write, Ferdinand Harling, Shenandoah, Iowa. my

FOR SALE—Patent No. 910,785, issued Jan. 26, 1909. The ultimate universal detachable sanitary soap dish. Fits all basins. Holds soap firmly when throwing water out. A boon to all homes, camping and outing parties. Can be manufactured at small cost. Apply to T. C. Colton, Griswold, Man., Canada. my

FOR SALE—U. S. Patent No. 889,151, granted May 26, 1908, Street Car Fender. Has telescoping section to save persons struck by moving car. Address, H. M. Prater, Box 27, Crocker, Missouri. my

FOR SALE—U. S. Patent No. 927,356. Also Canada and Great Britain patent rights. Wonderful heating drum: throws all the heat down: absolutely no odors; burns half the gas of any stove of its size known. Will sell one or all three patents. For description, illustration, etc. Address, Dr. W. S. Keyser, Everett, Wash. my

FOR SALE — The best Can Opener on the market, patented December 24, 1907, patent No. 874,457. Will sell outright at reasonable price. Would like to hear from any one who buys patents. For further information address, L. P. Therriault, Bonfield, Ont., Canada. my

FOR SALE or on royalty—U. S. Patent No. 949,310, dated Feb. 15. 1910. This invention relates to a detachable button which is useful for all kinds of garments. Can be put through between the goods and locks itself. Can be taken off without leaving any mark. Also useful for uniform garments. Canadian patent applied for. Address, Joseph Tams, No. 208 Mulberry Street, Trenton, N. J. my

FOR SALE—Patent applied for, Serial No. 532,406. Splice Bar Lock. Does away with all nuts and bolts at rail joints, and avoids drilling two holes in each end of rail. For information address, Edwin S. Shipman, 445 Stokes Ave., Braddock, Pa. apr

FOR SALE—Patents Nos. 916,868. dated March 30, 1909, agricultural implement; Patent No. 911,983, dated Feb. 9, 1909, belt replacer; and 911,876, dated Feb. 9, 1909, cultivator. Inventions also covered by Canadian patents. Will consider proposition for royalty, or will exchange for land and part cash. For further particulars address, John Horinek, Atwood, Kansas. jy

FOR SALE—Patents Nos. 938,538 and 938,539. Railway Ties. Can be laid by one man. Once laid always in proper alignment. Can be manufactured anywhere by anyone. Address, Lewis Wylder, Cathay, N. Dakota. apr

FOR SALE—Patent No. 934,571, Automatic Dip Tank for all kinds of stock. Stock go under tank and get dip on back, runs all over them. Protects stock from flies and all insect pests. Set in pasture in front of stall. Address, E. M. Reckards, Ozawkie, Kansas. apr

FOR SALE—Patent No. 933,951, dated Sept. 14, 1909. Mailbag Receiving and Delivering Device. Simple and practicable. Nothing like it on the market. Send for terms. Address, Herman H. Behnke, No. 212 West Fifth Street, Davenport, Iowa. mar

FOR SALE—Patent No. 620,239, issued May 4, 1909. Mail Receiver and Deliverer. Will sell outright at a reasonable price. For particulars, address Joseph O. Anderson, Bercail, Mont. mar '10

FOR SALE on royalty, my wrench—U. S. Patent No. 632,951, Aug. 31, 1909. No screws, springs, or teeth to play out. Strongest, cheapest, and handiest wrench on the market. Address, A. R. Bell, Evesham Via Macklin, Sask., Canada. mar

FOR SALE—Patent No. 937,299, issued October 19, 1909. Derrick bracing means. The real anchor discovered at last. To prevent the wind storms from destroying oil derricks and wind mills. Address, Frank E. Foster, Sapulpa, Oklahoma. mar

FOR SALE—Patent No. 927,28 8. dated July 6, 1909. Will sell broom hanger with two improvements. United States, $800; also invention in Canada for $800. Will take one cent on royalty, sell outright, or strictly honest partner. I have other inventions. Address, James H. Ashmead, Lake George, N. Y. mar

FOR SALE—A valuable patent tool. Spacing instrument, a divider and caliper for the measurement of solid or tubular columns inside and outside. Cheaply manufactured; large profits. An aid to mechanics, designers and other professions. Further particulars will be furnished by Theodore Siragusa, No. 463 Broadway. Paterson, N. J. mar

FOR SALE—Patent No. 932,931, issued August 31, 1909. Gold Saving Apparatus. A new practical automatic, mechanical combination for extracting gold from gravel. Ninety per cent of the gold contained in the matrix is recovered, whether in a fine, scaly, rusty or other state. Address, V. P. Yelmini, 2905 Lincoln Ave., Alameda, California. mar

FOR SALE—Patent No. 870,949. Trunk-Tray Form. A time and labor-saving device, which means something to the employer. Investigate! Drawings mailed free. Price $2.000. Address, W. S. Gilson, 347 South State Street. Chicago, Ill. mar

FOR SALE—Patent No. 910,950. Concrete Ornamental Lawn Fence. Very attractive. Will sell right or half interest. Pays to market. Full particulars with pleasure. Address, Box 9, St. Jacob, Ill. mar

FOR SALE—Patent No. 913,988. Self Feeder Potato Planting Sack. Price $200. Drops the potatoes directly into the planter from the sack. If interested write me for copy of patent. A. C. Simonis, R. F. D. No. 1, Box 78, Amherst Junction, Wisc. mar

FOR SALE—Patent No. 932,806, Aug. 31, 1909. Collapsible Box. Can be used for egg cases, fruit cases and boxes too numerous to mention. Will sell same at a reasonable price. Address, Oscar A. Paulson, River Falls, Wisc. aug

FOR SALE—Patent No. 857,075, dated June 18, 1907. Method of protecting corn or vegetable matter against weevils. Successfully tried. Will sell outright at a reasonable price. Address, Box 42, Peters, Texas. apr

FOR SALE — Patent No. 936,259. Combined shipping box, crate, and coop. Made of wood, sheet metal, or wire. When collapsed is only four times thickness of material used. Would let on royalty $500 bonus. Address, G. W. Sharp, Francis, Okla. apr

FOR SALE or royalty—U. S. Patent No. 909,952, dated April 27, 1909. Box or case. Simplest and cheapest, for cigarettes and like articles. Delivered singly through pressure. The box can be made from any material. Nothing similar on the market. Great novelty. Address, A. Tsakonas, 5801 Chestnut St., Philadelphia, Pa. apr

FOR SALE—Patent No. 583,494. Combination Book-Shelf and Book-Support. An excellent support. Easily applied to fit any shelf and books. Reasonable price. Address, August Lundberg, 41 Catherine St., Worcester, Mass. my

FOR SALE—Patent No. 935,255, issued Sept. 28, 1909. Baling Press. Triple stroke with automatic tripping attachment to trip the plunger at any time and withdraw same. Address, P. A. Guenzel, R. F. D., No. 3. Bartlett, Texas. apr

WANTED.

WANTED—To correspond with patent owner of an article of merit, neither seasonable nor perishable, and marketable any place. We manufacture and sell. Address, W. H. Davis & Sons, Newark, Ohio. my

WANTED—A company to buy or manufacture on royalty our automatic car coupling, U. S. patent No, 933,924, and Canadian patent No. 111,381. The best automatic coupling ever invented. Address, George Sarrazin & Hector Perreault, No. 653 Canal St., Holyoke, Mass. my

WANTED—1000 ratchet braces manufactured for cash or on royalty U. S. patent No. 878,404, issued Feb. 4, 1908, and after they are sold as many as the trade demands. Address, Israel Larson, R. F. D. No. 2, Box 179, Sandy, Utah. my

WANTED—Financial assistance in protecting and exploiting five inventions having originality and merit which will commend them to the countries of the world. Liberal interest will be given in the patents to be procured in exchange for the capital necessary for the making of models, incidental and other expenses. For full particulars address, John Horinek, Atwood, Kansas. jy

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Make Patent Infringement a Misdemeanor.

A Suggestion from the Copyright Law.

THE INVENTIVE AGE has repeatedly commented upon the new copyright law, but there is so much in this comprehensive measure that is worthy of attention, that we ask the indulgence of our readers in considering another provision of the law, which has not heretofore been mentioned in these columns. Section 28 of the Act provides:

> "That any person who willfully and for profit shall infringe any copyright secured by this Act, or who shall knowingly or willfully aid or abet such infringement, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by imprisonment for not exceeding one year or by a fine of not less than one hundred dollars nor more than one thousand dollars, or both, in the discretion of the court; *Provided, however*, that nothing in this Act shall be so construed as to prevent the performance of religious or secular works, such as oratorios, cantatas, masses, or octavo choruses by public schools, church choirs, or vocal societies, rented, borrowed or obtained from some public library, public school, church choir, school choir, or vocal society, provided the performance is given for charitable or educational purposes and not for profit."

In effect, this means that any one who willfully (and of course that indicates knowingly,) and for his own profit, infringes any copyright secured under the Act of 1909, or who aids or abets in such infringement, shall be considered to commit a misdemeanor, and be punished as the Act prescribes. The copyright Act is wonderfully complete in the provision made for civil remedies, but the particular section quoted will do more than anything else to protect the proprietor of a copyright in his exclusive rights. The advantage of making the infringement of a copyright a misdemeanor, resides in the fact that the owner, when a case of infringement is brought to his attention, may threaten the offending party with a suit, and if the action is persisted in, he may have recourse to the nearest United States District Attorney, and by virtue of Section 28 of the law, request the proper action. The Government bears all the expense of such proceedings, and reenforces them with its full authority in bringing the infringer to justice. Thus, if the owner should find that the infringer is a person of no responsibility and that his civil remedy would be inadequate, he can turn to the Federal Government for assistance. This provision of the law does not in any way affect the civil remedy, for the owner may in addition to criminal proceedings against the infringer, have recourse to the other action as well, to recover profits and damages. This combination of civil and criminal proceedings is calculated to deter any sane person from infringing copyrights. Civil suits do not frighten certain classes of people —the very rich and the very poor— but no man considers lightly a criminal action, particularly when the Federal Government is back of it. Witness the alarm when the Attorney General, or any of his subordinate district attorneys, takes action against a trust for violating a law. The effect of this provision of the copyright statute is to make the United States Goverment support every copyright certificate, and it is not difficult to see the advantage it gives a copyright proprietor.

This brings us to a consideration of a matter which we have often urged in these columns—the advisability of the incorporation of a criminal provision in the patent statutes, making willful infringement of a patent a penitentiary offense. Now that Congress has taken such action in regard to copyrights, it would seem that the next step is to similarly amend the patent law. There is a general feeling among inventors that the Government should guarantee its patents, and be prepared to protect them with its full authority. This is the attitude taken in most foreign countries. Indeed, it is the rule abroad, and not the exception, for the infringement of a patent to be made a penal offense. In Germany, especially, the issue of a patent is regarded as a solemn act on the part of the government, and all the power of the central authority supports the owner of the patent in the protection of his interests. As a result, the mere suggestion to a party that he is infringing a patent is sufficient to frighten him.

Under the present law, a patentee is dependent upon his civil remedy only, and the decisions of the courts on the subject of "profits and damages" are so abstruse and technical and are applied so frequently against the patentee, that the latter is fortunate if he gets anything more than the court costs of a suit, even when he prevails in the litigation. Again, it is often shown at the conclusion of a suit that the defendant is not possessed of any tangible property to which a judgment may attach. With a criminal provision in the patent statutes, the situation would be radically changed. A patentee could then invoke the aid of the government in protecting his patent; and what is more important, the infringement of a patent would not be considered such a negligible matter as it is at present. The mere fact that such an infringement was a penal offense would greatly reduce patent litigation. Further, it would enhance the commercial value of a patent. Of course, with such a provision in the statutes, the Patent Office would have to stop issuing patents on trivial improvements, and would have to make a more thorough and exhaustive examination than it now does; but by the time the patent statute is amended as indicated, we believe that the Office will have so progressed that many evils of the present practice will have disappeared. We are convinced that the time will come when the inventors of this country will demand the inclusion in the patent statutes of a section similar to that now covered by the copyright law. Such an action cannot be taken too soon for their welfare.

Wanted–A New Patent Office Building.

The need of a modern and suitable building for the Patent Office has been often emphasized, but the substantial efforts now being made to bring about action by Congress have aroused renewed interest in the project, and new hope in its realization. It is generally admitted that the time is ripe for legislative action. The bill of Senator Daniel of Virginia appears to meet with general favor, and with no opposition. The plan to locate the Office on the square just north of the Congressional Library, and to make it of the same size and general architectural effect as that fine building, cannot be improved upon. The Congressional Library is by far the most handsome structure in Washington, if not in the country, and its beauty is commented upon by all who view it. It is true that the Burnham Commission, in its comprehensive plans for the artistic future of the National Capitol, advised that future government buildings should be located south of Pennsylvania Avenue; but it is also proposed to surround the Capitol plaza with these impressive structures, and only one space is now needed to be filled in this part of the plan—the one where the bill would locate the Patent Office. This is a much better situation for it than in the Mall, as a firmer foundation would be assured. Then the Library of Congress and the Patent Office are two public institutions of a co-related character. One represents the protection of the human brain in its literary and artistic genius, the other its mechanical and technical development. By the proposed arrangement, two monuments to America's recognition of man's intellect would be reared side by side under the very shadow of the dome, thereby completing the group of buildings of which the Capitol is the center.

As has been so often stated that repetition seems superfluous, the Patent Office is a self-supporting bureau, turning into the United States Treasury each year a large surplus after paying all expenses of conducting its work, including salaries, supplies, court fees, etc. There is now in the Treasury within a few dollars of $7,000,000 to the credit of the Office, every cent of which has been paid by inventors, and which represents the actual earnings of the Office. The site suggested could be purchased, and a suitable building erected, within this amount.

It is a crying shame that the conditions which prevail in the Patent Office should be allowed to continue. There are divisions in which seven or eight men are crowded into one room. Entirely apart from the standpoint of hygiene, it is obvious that such circumstances must affect the quality of the work and the management of the business. We venture the opinion that in a suitable building and with proper facilities, the work of the office would be materially advanced. The authorities of the Office have for the last fifteen years been resorting to various expedients—some of them almost desperate—to make the old structure expand in proportion to the growing needs, but the limit has been reached, and it is clear that steps must be taken immediately to provide larger and better accommodations for this most important service. The Library of Congress is not a self-supporting bureau by any means, and yet it has a building devoted exclusively to its own use, with the most up-to-date facilities for carrying on its business. The Patent Office should be similarly equipped. Every convenience for expediting the work of examining and passing upon the applications for patent should be offered. This service cannot be given in inadequate quarters, where valuable records are found in inaccessible places, and work of a technical and exacting character is done in cramped surroundings and with all sorts of handicaps.

One thing for which there is a serious need, in this connection, is a laboratory where the working of inventions could be shown to examiners by inventors, and the officials could make tests. There are absolutely no facilities in the Office at present for any such exhibitions. The congestion is such that it is difficult to exhibit models, and any operation of the same is impossible. And yet the method of operation may be an essential part of the apparatus. If it is necessary for an examiner to see a demonstration of the working of an invention, he must either go to some shop in Washington, outside the Office, or visit another city—at the expense of the inventor—where better facilities are offered. In a recent instance, an inventor had completed the model of an electric appliance, and it required a current of a certain voltage to achieve the desired results. The inventor was obliged to get the examiner to accompany him to one of the power houses in this city in order to give a demonstration of the ma-

chine; thus taking the time of both men, as well as of the attorney, to make the visit when it was convenient for those in authority there to have the experiment made. Commercial progress is concerned in this matter, and that is the heart and core of the nation. Every inventor, every business man, every manufacturer is interested, directly or indirectly, in seeing that the Patent Office is furnished with an adequate building for its work. Every man is a potential inventor, and every invention represents a step in advance in the arts, and may be the beginning of some new enterprise or industry. When one looks around him and sees how many devices, of widely different character, have been protected by patents, he realizes what a vast multitude of interests are concerned in this matter. It should not be necessary to do more than lay the subject before Congress. The need is so urgent, and the claims so just, that speedy action should be expected as a matter of course. But in view of the proverbial slowness of our legislative body, and the pressure of other demands, it is sometimes well to take steps to keep important measures fresh in its mind. Inventors and others interested—and this means every one—should constitute themselves, each a committee of one, to see to it that his Congressman is fully informed as to the urgency of this question, and request him to work for the bill introduced by Senator Daniel, and try to secure its enactment at this session. Let us have a new Patent Office building at once.

Grass Matches.

The fact that lumber for the making of matches is becoming scarce in this country lends special interest to a report from British India that grass is being successfully used for match sticks. At Sholapur, India there is a factory which is making matches from a kind of grass, which is abundant in those regions. The grass is cut into two-inch lengths, winnowed and screened to obtain uniform size, and then boiled in paraffin for five minutes and dried in a revolving drum. Twenty-four pounds of Burma paraffin is sufficient for 8,000 boxes of matches. Shaken through a horizontal sifter, they are deposited in horizontal layers, which are secured in a frame for the dipping of the ends, and dipped in a solution of chlorate of potash, sulphate of arsenic, potash of bichloride, powdered gypsum and gum arabic. Six pounds of this mixture provide enough for 7,000 boxes of 80 matches each. By an ingenious contrivance, some of the closely packed stems are forced forward in the dipping so as to avoid the sticking together of the compact mass. After drying, the matches are packed in cardboard boxes. Materials are so cheap that matches sell for 26 cents per gross.

Paper Straws.

Straws that are not straws are the ones used at soda fountains. They are composed of paper, a fine and tough kind of manila, made especially for the purpose, and quite different from the coarse variety used for wrapping. The making of a paper straw may seem a simple thing, but a number of operations are necessary before the factory turns it out. The reams of paper are first cut into strips. Four reams, or nearly two thousand sheets, are cut at one time, and each descent of the knife makes that number of strips about 30 inches long, an inch wide at one end and an inch and a quarter at the other. As the paper is wound around the spindle the coils get closer together, and for this reason it is necessary to have the paper tapering in order that the completed straw may be of the same thickness from end to end.

The machine for rolling the paper consists of a long steel spindle, held horizontally by a single bearing at one end and provided with a grooved wheel to engage with the belt which rotates it, and also having four notches near the same end, in which one end of the paper is caught. The machines are arranged in a double row, and power is transmitted to all of them by a single belt, like a sewing machine belt, which runs under each pulley from one end of the row of machines to the other. Ordinarily, the spindles are at rest.

The operator, usually a girl, sits with her left side to the machine, and with the left hand places one end of a strip of paper in one of the notches, and with the pressure of the foot brings the grooved wheel into contact with the belt. In less time than it takes to tell it the paper is rolled into the form required, and is held in this condition by a bit of paste which had been applied to the free end before the winding began.

The paper tubes are now coated with paraffin. This is effected in a tank half full of melted paraffin, kept hot by steam pipes in the bottom. A vertical shaft passes through the tank, and it is provided with platforms upon which wire baskets may be placed. When these baskets have been filled with the paper tubes they are immersed in the hot parraffin for a minute and then raised into the upper part of the tank. This time has been sufficient to coat the outside and to fill the tubes completely with the paraffin. That which has been retained within the straws must be removed, and to accomplish this the baskets are whirled around in the upper part of the tank for a few moments, the superflous material is thrown out, and what remains is dried to form the coating.

Up to this point in the process the tubes must be handled with care, and even then some may have been crushed and spoiled; but now they are stiff enough to withstand handling better. When turned from the baskets on the table they are still hot, but in a few moments become cool and dry so that they will not stick together. They are now practically complete, and it only remains to cut them into proper lengths and pack them or shipment.

Six rubber bands are laced around a bunch of the long straws, in such places that when the bundle is sewed into three lengths, each short bundle will have a band at each end. The saw used for this purpose is thin, the teeth are fine, and they have no set.

As the operators are paid by the piece, it is now necessary to count the straws and credit the number to the proper person. For this reason the work of each girl must be kept separate until it has been packed into boxes, and as each box holds 500 straws, the proper credits can be made. The usual output of the factory is six hundred thousand straws a day, and this is accomplished with a force of twenty girls. In the busiest part of the season as many as a million straws are turned out a day.

A Remarkable Viaduct.

A concrete viaduct three thousand feet in length and varying in height from 18 to 70 feet, forms one of the most remarkable recent performances of engineers and builders in the field of railroad construction. Reinforced concrete is finding new triumphs almost hourly, and it has taken a place in the building world which had been but improperly filled. It is common to hear of the employment of this material in public works, for the records it has made have roused popular interest. But this achievement of the builders is almost unique in its own field, and seems to mark a new step in advance of older methods. It happened that the right of way of a railroad which sought to enter Richmond, Va., on an elevated track, ran close to old wooden structures of a most inflammable character, and the fear of fire prevented the consideration of wood as a material for the viaduct construction. Steel was at once suggested, and the first plans were made with this in view; but the engineer in charge proposed reinforced concrete, and it was finally adopted.

Whether the general public understands just what is meant by reinforced concrete is a matter of some doubt. What is practically concrete was used by builders in Old Mexico so many centuries ago that the age of some of the works which still stand as monuments to their knowledge and skill is past counting. Cement in various fields has been successfully used from the time of the Aztecs down to the present. But it is only in recent years that the real value and indestructability of the material, and its tremendous reliability, have been fully recognized. When the limit of knowledge about the proper mixing of the sand and water and cement and stone had been reached, it was discovered that the introduction of steel bars and rods and rings into the mass, and the proper disposal of this reinforcing, made the whole so immensely superior, not only to the concrete alone, but also to any other material known for use in the field to which it was adapted, that it sprang immediately into great favor.

Plain bars were at first used, but it was found that these did not provide for all the strains which a beam or a slab might be called upon to bear and, through a gradual evolution, the use of what are called shear members, which are struck up from the side of the main bar and bent at an angle of 45 degrees and therefore rigidly attached, came in. When a beam reinforced in this manner was tested to destruction, it was found that it would break fairly in the middle, proving that every portion of the beam acted uniformly. This made it possible for the designer of a given piece of work to calculate exactly the proportions of concrete and steel and size of beams necessary. Europe leads just now in the use of the new material, but America is setting a pace which promises to out-distance the older country in the near future.

As has been said, the fear of fire was a prime consideration with the railroad in the building of this particular viaduct near Richmond. The growing scarcity of timber and popular sentiment in favor of more careful construction also weighed in the decision to make use of the more permanent material. The *Technical World* gives the following description of the structure. The foundation was laid of stiff clay and gravel, and footings built to bear a weight of three tons per square foot, to provide for all possible stresses, including proposed future double tracking. The concrete was made of one part Portland cement, two parts granite dust and four parts crushed granite, to pass through a three-quarter inch ring. Throughout was used a steel trussed bar, made as above described, for the reinforcing.

The spans vary in length from 18 to 70 feet, the latter distance from support to support making many builders open their eyes in wonder. But in completed form the whole viaduct is practically one great monolith, as truly as if it had been carved out of stone—with the added strength, quite beyond that of any stone, imparted by the steel within its body. Its appearance is much more sightly than the steel trestle, and stands as an object lesson of which the concrete men all over the country are proud, and to which they point in vindication of their claims in this line.

In testing the viaduct, before it was accepted by the railroad, a locomotive and tender, and two steel gondola cars loaded with steel rails and weighing about 150,000 pounds each, were run the full length of the structure. The train was then run back and deflections measured for several spans. After that a test was made by braking the train at various points on the viaduct, and finally by running the engine and cars at a speed of 36 miles an hour over the structure. A deflection of seven-thirty-seconds of an inch was the maximum, which proves the elasticity and reliability of the material. Trains have for some time been running on regular schedules, and the viaduct has thoroughly demonstrated its stability.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Gear apparatus, Variable-speed transmission-....C. A. Morris
Gold-saving machine....F. B. Roberts
Governor for groups of power-engines, Indirectly-acting....D. Thoma
Grain-binder feeder....J. Lindner
Grate-bar....E. A. Wildt
Grate, Dumping-..H. C. Hoener and F. Andreas
Grater, Nutmeg-....R. Jordan
Grinding-machine....H. B. Nichols
Grinding machine, Breaster-knife-....J. J. Heys
Gripping device....W. D. Roop
Gun....S. Faber
Gun, Air-....W. A. Heilprin
Gun-sight....C. H. Gordon
Hall-stand, step-ladder, ironing-board, &c., Combined....V. J. A. C. Mengers and L. Larsen
Hammer, Foot-power....O. W. Mielenz
Harness-dressing....R. F. Meader
Harrow....J. H. Lindsey
Harvesters and binders, Shocker attachment for grain....E. A. White
Hat safety device, Gentleman's-..E. R. Vasconcellos
Hay-loader....F. W. Compton
Hay-pitcher....W. C. Grauer
Hay-pitcher....A. H. Bosworth
Hay-press....J. Dain
Heating apparatus....J. M. W. Kitchen
Heating system....N. M. Finley
Heating system....E. H. Gold
Heating system (reissue)....E. H. Gold
Heel-nailing machines, Cementing attachment for....E. A. Webster and C. R. Towle
Hinge....T. H. Riordan
Hinge, Double-acting spring-....E. Bommer
Hog-cleaning vat....J. C. Cartmill
Hoisting mechanism for cranes....H. Sawyer
Hook-and-eye fastener....P. Mulock
Hot-air furnace, 2 patents....C. A. Simonton
Hydraulic motor....A. O. Lavoie
Hydraulic motor....W. G. Stowell
Hydrocarbon-burner....W. J. Best
Incubator....A. Nobel
Ink and mucilage stand....D. H. Edwards
Ink-well cover....R. H. and R. J. Brown
Insect-catching machine....J. M. Anderson
Insole-reinforcing machine....W. H. Hooper
Iron and residues, Treating detinned....W. W. Murray and H. M. Fernberger
Iron, Briqueting metallic....L. Weisz
Jar closure or cover and the like....J. W. Moody
Joist-hanger....H. C. Seipp
Keg or cask....O. R. Yeazell
Key-cutting machine....W. F. Billings
Key-holding device....J. P. Hulder
Knitting-machine....W. W. Burson
Knitting-machine, Yarn-changing mechanism....W. W. Burson
Knitting-machines, Racking device for flat-bed....E. Dubied and B. Popp
Knob attachment....J. R. Fletcher
Ladder....H. Schonich and J. Langer
Lamp-guard, Portable....W. T. Russell
Lamp-lighter, Automatic....L. J. Graham
Lamp, Miner's....T. A. Black
Lamp socket, Electric-....F. P. Poole
Lamp socket, Incandescent-....L. Dorner and G. H. Norquist
Landaus, Folding post for....W. B. Pond
Lantern, Signal-....G. P. Browne
Lasting-machine....W. E. Wade
Latch, Safety door-....A. C. Hope, F. Farquhar, and C. A. Hilchey
Leuco body containing sulfur and making same....B. Homolka and R. Welde
Lifting-jack....F. W. and W. M. Stice
Lifting-jack....E. J. Jutz
Line-roller....W. Reuter
Link, Detachable....J. B. Cochran
Liquid-dispensing apparatus, Coin-controlled....M. L. Buck
Liquid-gage....A. S. Garlick
Lock....H. W. Simpson
Lock-casing....H. W. Simpson
Locomotive and other furnace....A. F. Kingsley
Locomotive ash-pan....J. H. Gee
Log-turner....F. G. Harrington
Loom let-off mechanism, Narrow-ware-....J. C. Gaynor
Loom, Weft-replenishing....B. F. McGuinness
Loom, Weft-replenishing....E. H. Ryon
Looms, Device for prevention of arbitrary registration in counters for mechanical....S. Marschik
Looms, Filling-detector mechanism for weft-replenishing....B. F. McGuiness
Looms, Filling-exhaustion-indicating means for....A. E. Rhoades
Looms, Thread-parting mechanism for....W. H. Spencer and A. Hurst
Lubricator device....R. F. O. G. van Zoelen
Mail-bag deliverer....J. H. Sweeney
Mail-bag-delivering apparatus....H. J. Hedrick
Mail-delivery apparatus....S. Henry
Mail-delivery case....R. Brown
Malting apparatus....J. F. Dorneld
Manure-spreader....J. H. Bloom
Map, globe, and other geographical appliance, Geographical....W. Wilson
Marking and cutting goods for garments....F. P. Mackenzie
Measuring instrument, Electrical....T. W. Varley
Measuring-machine, Automatic....E. Whitten, Jr., and A. A. Harrell
Measuring machine, Cloth-....B. D. Wight
Meat-holding device....J. W. Breedlove
Meat into slices, Machine for cutting....F. Graff
Mechanical movement....W. S. Allan
Medical appliance, Electrical....B. R. Davenport
Metallic tie....E. F. Kenney
Milk, Fermentation of....J. P. Cabanne
Milling attachment, Universal....G. G. Porter and F. E. Cable
Mine-shaft equipment....H. L. Templer
Mining machine, Coal-....A. H. Gibson
Mop-wringer....C. Callis and W. D. Fulbright
Mower, Lawn-....H. H. Benson
Musical instrument, Automatic....P. A. Bayless
Musical instruments, Paper-winding mechanism for, 2 patents....P. Welin
Nozzle, Sprinkler-....W. G. Hughes
Nut-lock....F. A. Headson
Nut-lock....G. A. Pattillo
Nut-making machine....W. L. Clouse
Oar-lock....E. L. Montague and E. A. Stewart
Oiling fellies, Apparatus for....D. D. Frisbee
Opthalmoscope....F. Baum
Oxids of nitrogen from the air, Production of....F. I. du Pont
Packing and making the same....C. I. E. Mastin and E. L. Perry
Packing for stuffing-boxes, Metallic....R. Allen
Packing, Metallic rod-....G. B. Maltby
Packing-ring....K. Rosholt
Paint, Steel-preservative....C. Ellis
Paper-hanging machine, Wall-...N. M. Purviance
Paper receptacle....W. Nemsey
Partition-holder....R. M. Vick
Pattern-drafting apparatus, Garment-....E. J. Curran
Pen-feeder....F. M. Connolly
Penholder, 2 patents....H. E. Hoke
Perforator, Tape-....H. Angel
Piano-case....C. H. Hubbell
Piano, Pneumatically-operated..A. G. Gulbransen
Picture, Roll-up....M. E. Scott
Pipe connection....A. Holloway
Pipe-coupling....C. J. Smith
Pipes, Slip-joint for steam-....J. E. Struer
Pistol....M. J. Shimer
Planter, Check-row corn-....A. Stayman
Planters, Trip mechanism for corn-....H. E. Herbrandson
Plow....G. W. Bristow and G. O. Doty
Plow attachment....C. Williams
Plow attachment....P. Neufville
Plow, Ditching-....C. F. Sedell
Plow-foot....R. M. Frederick
Plow, Subsoiler-....J. M. Hodges
Plug, Separable attachment-....H. Hubbell
Plumber's use, Wrought-metal fitting for....W. H. Perkins
Pneumatic actuating unit....A. G. Gulbransen
Pocket-knife....J. A. Nell
Pole-disconnector....J. Viet
Pole tip, Wagon-....A. Fischer
Post-mortem table....T. B. Hennessy
Posts and poles, Composite support for....J. F. Hickman
Potato-picker....O. Sutter
Power-transmitting mechanism....J. L. Jones
Press....C. L. Petz and W. E. Wallace
Printing Press driving mechanism..E. E. Babcock
Propeller, Boat-....F. P. McElfresh
Pulverizing or grinding mill....E. H. Callaway
Pump....N. McCarty
Pump....C. O. Lucas
Pump and egg-beater, Cream-....J. H. Reed
Pump attachment, Tire-....H. H. Rung
Pump, Circulating-....E. Guenther
Pump, Governed....N. McCarty
Pump, Steam and vacuum, 2 patents....R. E. Cecil and C. R. Wassell
Pump, Vacuum-....F. A. Simonds
Puzzle....A. Garland
Quilting-frame....D. W. Phillips
Radiator....S. Lavine
Rail-cleaner....J. P. Gorman
Rail-controlling device, Switch-....A. Jobin
Rail joint and chair, Combined....Z. T. Hoskins
Rail tie and chair, Metallic....E. Wheeler
Rails and beams, Tie-joint for....A. Ristuccia
Railway-brake....C. E. Duffie
Railway-crossing..C. A. Alden and G. S. Vickery
Railway electric switch....R. B. Bryant
Railway-joint....J. S. Skaala and E. H. Hilliard
Railway-signal....W. J. Simpson
Railway-tie....C. L. Frevert
Railway tie and rail....I. J. Gray
Railway-tie and viaduct for wires, Combined....A. McArthur
Railway-tracks, Sod and ditch line marker for....H. J. Schweitzer
Railways, Overhead construction for electric....E. E. Gilmore
Railways, Overhead switch for electric....E. E. Gilmore
Ratchet-wrench, Socket reversible..D. F. Vollmer
Reaper and binder....C. O. Wyman
Receptacle....F. Hardinge
Receptacle and closure....G. E. Decker
Receptacles, Construction of....A. T. Kruse
Reciprocating engine....J. Holgate
Reclining-chair, Adjustable....J. F. Wilmot
Recoil-loader with fixed barrel....P. Mauser
Recoil-pad....J. S. Johnson
Reeling-machine reel..A. McLane and G. Sipp
Refrigerating and ice-making plants, Expansion-coil for....R. Whitaker
Refrigerator or cold-storage room....E. J. Wirfs
Registering mechanisms, Stop device for....C. F. Littlejohn
Rein-holder....H. F. Schmeckpeper
Reinforcement-bar....W. G. Hughes
Relay, Overload and reverse current....P. O. Keilholtz and F. E. Ricketts
Revolver....T. M. Du Bose
Rheostat....H. L. Truesdale
Roof-bracket..W. T. Gallagher and J. W. Bliley
Rope carrier, Fall-....W. A. Wood and C. W. Kahlerth
Rotary motor....R. McGraw
Ruhber and cellulose, Manufacture of products containing india-....P. Defaucamberge
Sack-holder....J. Rix
Sad-iron support....G. Ellstrom
Safe, Collection-....G. L. Maw
Safe, Fireproof....P. Adolphs
Safety device....C. W. Burris
Sarcophagi, Mold for making....G. W. Brown
Sash-lock....F. C. Schaurer
Sash, Window-....W. W. Watson
Saw gage, Crosscut-..E. S. Ward and J. A. Hamilton
Saw-guide....C. E. Sees
Saw machine, Hack-....E. S. Bradford, Jr., and M. Olson
Saw, Power hack-....C. W. Bergmann
Saw-set....E. Chainey
Scraper, Wheel-mounted....L. C. Fasig
Screening apparatus....J. H. Lynch
Screens, Guide-strips for sliding....H. W. and W. W. Watson
Seal....A. W. Loshbough
Seeder, Broom-corn....J. W. Courtney and J. C. Porter
Seeding machine, Fruit-....B. H. and M. Paul
Sewing-machine cabinet, 2 patents....W. C. Free
Shaft, Flexible....W. G. Bambridge
Sheet-metal panel....A. J. Thornley
Shell-crimper....L. E. Thompson
Shingle, Interlocking metallic....G. H. Pedla
Shock-absorber hanger....E. Fentje
Shoe-block....W. W. Kimble
Shoe-filler....E. R. Taylor
Shovel ng-board..F. Stewart and E. W. Neiswanger
Sifters, Control device of (reissue)....A. C. Brantingham
Sign-holding apparatus....C. P. Rall
Signal system, Electric....A. L. Sohm
Signal system, Theater-chair-....P. T. Kenny
Signaling and switching apparatus, Electrical....R. H. Manson
Singeing-machine....D. Davis and A. O. Berry
Skiving-machine..W. A. Parmenter and A. B. Alden
Sleeper, Cast-iron....W. R. Haughton
Slicing or chopping machine, Fruit and vegetable....W. H. Boutell
Smoke-consumer....A. Kohn
Snap-switch, Two-pole....L. Kellner
Sound-recording apparatus....T. A. Edison
Spanner-wrench....L. R. Hoffman
Spark arrester and extinguisher...A. W. Graham
Spoon....I. B. Harn
Spout, Flexible feed-....L. V. Rathbun
Stacker, Automatic hay-....H. N. Renner
Stair, Folding....J. A. Flynn
Stamp-affixing machine....J. W. McCann
Stamp-strip....S. L. W. Coe
Station-indicator....E. L. Pitts
Steam and hot-water boiler....T. Wheatley
Steam-drier....C. H. Noyes
Steam-engine....E. J. Hamilton
Steam-generator....M. Connor
Steam-generator, Electrical....E. I. Rains
Stitching machine for pamphlets and similar articles, Thread-....H. L. Roberts
Stock detaching device, Live-....C. I. Aggerbeck
Stoker, Mechanical...H. Snyder and J. T. Hume
Stove....W. G. Shoals
Stove ventilator and hood, Cook-...P. Bernstein
Strainer, Vegetable-....J. McDonald
Straining apparatus, Liquid-....F. Bailey and F. H. Jackson
Straw-cutting-machine feeder....W. T. Bond
Straws, Dust-proof receptacle for tubular....J. Hurley
Street-sweeping machine....B. Kern, Jr.
Studding, Metallic..C. S. Mooney and J. Jantusek
Suit-case and the like....E. Ludescher
Suspenders....S. S. Kornreich
Swingletree....G. F. Thompson
Switch-indicator....C. A. Clark
Switch-operating device....W. N. Glosser

Switch-throwing, track sanding and sweeping device, Automatic....S. A. Johnson
Switchboard and cut-out....T. E. Murray
Syringe, Vaginal....W. Herschlay
Table....C. Han Horne
Table and desk, Combined....N. W. Schrunner
Tag holder and stringer and loop-knotter therefor....W. A. Haywood
Talking-machine horn....T. A. Edison
Tamping-machine....C. O. Brandell
Tap socket, Nut-....W. L. Clouse
Telegraphy, Space....L. De Forest
Telegraphy, System of directed wireless....E. Bellini and A. Tosi
Telephone desk set....C. D. Enochs
Telephone-disinfecting attachment....R. B. and L. Adams
Telephone-exchange system....W. A. Wynne
Telephone-mouthpiece....E. H. Long
Telephone system....W. A. Wynne
Textile fabric....J. C. Brooks
Theatrical appliance....R. Chandler and C. F. Autenrieth
Thermometer-case and instrument-holder....M. P. Hermann
Thread, Means for detecting enlargements in....J. Eastwood
Tile and tile-faced surface....W. P. Meeker
Tile-making machine, Cement-....T. P. Hackett
Tiles, Building-clip for....A. J. Eken
Time-movement....W. H. Taylor
Tire, Elastic wheel-....J. Dheyne and A. Bovy
Tire, Wheel-....J. S. Cushing
Tires, Flexible and elastic band for pneumatic....P. Roussillon
Tongs, Blacksmith's....W. L. Davis
Tongs, Shelf-....A. Rydquist
Torpedoes, Air-heater for automobile-....F. M. Leavitt
Toy....R. Kirkby
Toy savings-bank....F. P. Huyck and J. D. R. Lamson
Traction-engine....A. O. Espe
Transmitter, Multiplex....J. J. Comer
Transportation system....W. C. Carr
Trousers hanger and press....C. L. Harper
Truck, Car-....R. J. Edwards
Truck, Car-....J. C. Whitridge and C. B. Goodspeed
Truck, Car-....A. J. McCauley
Truck for cars, Swing-motion....C. D. Young
Truck, Railway-car....W. F. Richards
Truck structure for garbage or ash cans....M. T. Lyon
Trucks, Construction of car-....R. C. Wright and F. E. Stebbins
Trunks, Device for packing hats in....B. Dickenson
Truss....A. A. Klug
Truss-pad....I. M. Pease
Tube-cleaner....G. C. Bemis
Tube-forming machine....E. J. Steele and T. H. C. Hansen
Tubes, Screw-cap for collapsible....F. McIntyre
Turbine, Steam-....E. F. Edgar
Type casting and composing machine....O. V. Sigurdsson
Type-writing machine....J. H. Barr
Type-writing machine....W. J. Barron and H. W. Merritt
Type-writing machine....A. J. Briggs
Valve....J. Garvie
Valve....W. T. Fowden
Valve....W. Shurtleff
Valve, Air-....H. A. Fitzpatrick
Valve device, 2 patents....J. Miller
Valve-disk-cutting machine....F. L. Smith and T. B. Williams
Valve, Flushing-....M. B. Mahurin
Valve for evaporating-pans....G. G. Chasse
Valve-handle....W. P. Marble
Valve or cock, Blow-off....W. T. Fowden
Valve-spring lifter....P. Peterson
Valve structure....F. M. Stines
Valve, Tank-....J. T. Morrison
Vault, Burial-....W. and A. E. Livingston
Vegetable-cutter....J. E. Gloekler and A. B. Stahl
Vehicle, Land and water....J. Matthews
Vehicle-top-joint brace....J. C. Coss
Vehicle ventilating device....F. B. Pope and W. J. Lester
Vending-machine....W. H. Fulton
Vending-machines, Pocket-strip for use in....S. L. W. Coe and H. Werden
Vibration-absorbing foot....W. H. Sherwood
Wagon-brake, 2 patents....E. G. Doland
Wagon, Dump-....C. M. Haeske
Wagon-reach coupling....C. Myers
Wagon running-gear....C. M. Haeske
Washing-machine....W. Witt
Washing-machine....B. Kiss
Washing-machine cylinder....C. Jensen
Watch-balance-staff supporter....L. Prisant
Water-motor....W. G. Stowell
Waterproofing composition....L. A. Coleman
Weather-strip....J. E. Ledterman
Weather-strip, Movable....J. and J. Hemmerling
Weed-digger....R. R. Damoude
Weed-exterminator....E. A. Francis
Welding-burner....J. Knappich
Welding-machine, Electric-....A. E. Buchenberg
Well-cleaning device....F. A. Monroe
Well-sinking apparatus....M. T. Chapman
Wheel-fender....T. W. Mayson and J. Edgar
Wheels, Detachable rim for vehicle-....P. G. Challiss
Whip-lock....W. H. Beach
Whip-socket....J. A. Musgrove, Jr.
Wind-motor....H. W. Smith
Wind-motor....R. F. E. Okrassa
Window-cleaner....T. J. Rochford
Window-receptacle....C. E. Rogers
Window, Store-....W. E. W. Cherry
Wire reel and bundle remover....S. A. McCullough
Wire-rope clamp....C. L. Mounts
Wrench....H. E. Stephens
Wrench....A. D. Davis and W. A. Thompson
Wrench....W. N. Jay

DESIGNS.

Clothes-rack....J. H. Wilson
Electric-light cluster....R. B. Benjamin
Fabric....D. Valentine
Fob....I. R. Lederer

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MECHANICAL PATENTS.

Adjustable ventilator....F. Terramorse
Air-currents, Means for observing and separating heavy objects from dust-laden....D. Fogarty
Alloys, Making and casting....J. F. Monnot
Alloys of alkali-earth metals, &c., Production of....G. O. Seward and F. von Kugelgen
Amusement device....E. C. Beebe
Amusement device....C. F. Mack
Angle-indicator for portable machinery, Universal....W. T. McPhetridge
Annealing-box, 2 patents....F. E. Mesta
Ant-trap....J. W. Merser
Antifouling composition....C. Ellis
Apples and such like fruit, Apparatus for grading....J. Lomas
Apron....E. L. Henderson
Ash-pan, Gravity-slide....J. J. Ryan
Assay-furnace....B. E. Tennent
Axle and bearing, Car-wheel....G. F. Rendall
Baling-press....I. W. Rohrer, Jr.
Barrettes, combs, and the like, Die for....M. Falk
Basket, Coal-....H. G. Mitchell
Bath-cabinet....A. B. Renehan
Bath device, Spray or needle....W. E. Holmes
Bathing-suit, Buoyant....P. J. Griffin
Bearing, Ball-....H. Hess
Bearing, Roller-....A. L. Moore
Bed-bottom, Spring....J. L. Moore
Bed-couch....G. A. Lambert
Bed-couch, Folding....G. A. Lambert
Bedsteads, Locking-plate for the rails of....G. M. Donaldson
Belt-joint....J. C. Blevney
Belt-shifter....J. S. Elliott
Belt-stretcher....L. Eberline and F. M. Wanzer
Binder....J. W. Stevenson
Binder, Loose-leaf, 3 patents....G. C. Moore
Binder or loose-sheet holder, Temporary....H. F. Bushong
Blast-hole charger....A. Bohy
Blue-flame burner, Wick....A. J. Blackford
Boiler-cleaning apparatus....O. Donatz
Bolt and nut lock....M. W. Smith
Bolting-machines, Nut-feeding attachment for....A. H. McCutchan
Book, Loose-leaf....W. H. Bayles
Book, temporary binder, file, and the like, Loose-leaf....J. H. Hewitt
Boot and shoe tree and stretcher....W. H. Hooper
Bottle-capping machine (reissue)....T. J. Levey
Bottle-cleaning machine....A. A. Pindstofte
Bottle filling and crowning machine....H. A. Allwardt
Bottle, Non-refillable....J. J. Hourihan
Bottle-stopper....F. Gerhard
Bottle-washing machine....P. Polnisch
Bottles, intended to contain volatile liquids, Stoppering for....J. Bengue
Bow-fastening device....I. Roggenburg
Box corner-stay....R. J. Robillard
Box-fastener, Hook-and-eye....W. Gregson
Brake-head....A. Waycott
Brake-lever mechanism for carts and wagons....G. Manlove
Brake-shoe....H. H. McAlister
Brake system, Fluid-pressure, 2 patents....J. A. Hicks
Brick-machine, indenting....H. K. King
Brick-stroking-off machine....H. C. Kunkle
Brooder or coop, Chicken....E. M. Selzer
Broom-making machine....H. M. Marsh
Brush....M. P. Tottle
Brush, Toilet-....J. J. Lawler
Brushing and polishing fruit and other objects Machine for....J. B. Horrell and A. S. Bryant
Buckle....F. A. Russ
Building material, Composite....S. W. Bonsall
Burglar-alarm systems, Time-controller for....M. F. Juruick
Buried alive, Apparatus for preventing human beings from being....A. de Choinski
Burner....J. Dlugopolszky
Bushing, Bung-....F. Pfluger and E. Christensen
Bushing for bung-holes of beer-kegs....A. Speker and G. Schneider
Buttons, Post for link-....C. C. Ball
Cabinet, Lace-....W. F. McCracken and J. G. Bradford
Cable-conveying apparatus, Automatic traveling take-up for....C. R. Libby
Calculating-machine....T. Baeuerle
Calculating-machine....A. Bollinger, A. and E. Landry
Calendar for collection purposes....W. B. Crumpton
Cameras, Photographic....E. Brauburger
Can-caps and can ends from sheet metal, Cutting....B. H. Larkin
Can-closure fastener....S. B. Thomas
Can-feeder....W. Spain
Can-filling machine....C. H. Ayars
Car-coupling....H. J. Daubert
Car-door-operating mechanism....R. E. Frame
Car draft appliance, Railway-....H. C. Buhoup
Car fender, Street-....N. Juhasz
Car-mover....F. C. Bailey
Car, Railway motor hand-....W. S. Hovey and M. H. Rix
Car sand-box (reissue)....J. C. Duner
Car-stake....T. H. MacLafferty
Car stake, Logging-....A. Benedict
Carbureter....A. D. Elliott
Carbureter....M. E. Hunter
Cardboard-creasing machine....E. W. Bonfield and J. E. Fellows
Carpets and the like, Edge-retainer for....E. H. Smart
Carton....A. L. Smith
Cement and concrete mixer....W. D. Wise
Cement-block-molding machine....L. P. Normandin
Cement flint clay brick for metallurgical and other purposes....C. E. Pope
Cement, Process and apparatus for artificially aging or seasoning Portland....T. A. Edison
Cement-shingle machine....L. G. Satterlee
Cement-silica brick for metallurgical and other uses....C. E. Pope
Chain-beaming machine....A. E. Flight and S. M. Tilton
Chain-grate furnace....L. H. Maxfield
Chain-hook....J. M Sharp
Chair attachment....C. P. Ingersoll
Channeling-machine....A. H. Gibson
Cherry-pitter....J. D Houck
Churn, Auto-operating....J. H. Helms and J. E. Black
Chute, Hog-....J. Rada
Cigar-pressing box....R. Woerner
Clamp....C. I. Lender
Cleaning apparatus, Suction....G. R. Binm
Clevis, Spring-....C. Mullin
Cloth shrinking and pressing machine....L. Rothschild
Clutch for wire-blocks....J. H. Reece
Clutch-shipping mechanism....J. W. Latimer
Coin-selector....G. C. Reith and G. F. Flade
Collar and hames, Horse-....P. L. Johnson
Collar-support....M. M. Stillman
Colter, Plow-....E. Brown
Comparator....J. S. Bancroft
Composing-machine, Record-strip....J. S. Bancroft and M. C. Indahl
Compounds containing the acetyl group, Preparing organic....M. Mugdan
Compression-bib....J. N. Mortimer and E. L. Strauss
Concentrator....E. B. Thomas
Concrete building-block....J. J. Coyne
Concrete buildings, Forming....P. H. Bosworth
Concrete ceilings and supporting-columns, Means for forming....P. A. and L. P. Deslauries
Concrete structures, Reinforcing-bar for....D. Baum, Jr.
Cooking utensils....E. L. Ankrom
Cooling-board....C. E. Windom
Coop....J. P. Mann
Coop or crate, Foldable chicken....M. Parsons
Cork-feeding attachment, Crown-....E. R. Freyer
Corks in bottles, Device for locking....W. Schroeder
Corn-husking machine....A. Rosenthal
Coupling....E. A. Koschinki
Cover....F. Ohrmundt and J. Kramer
Cracker-jar....E. F. Reiff
Cramps, &c., Holder for....H. Antoine
Crank-handle....A. W. Beaman
Cream, milk, &c., Apparatus for treating....A. H. Reid
Crimping-machine....A. G. Legg
Cross-tie....J. S. Schaeffer
Crushing machine....J. E. Blake
Cultivator attachment....D. Bonnett
Cultivator-shovels, Detachable point for....T. E. Friend
Cultivator, Spring-tooth....G. G. Brigden
Culvert, Corrugated-metal....E. Pankhurst and A. C. Bisbee
Current-testing device....H. H. Morrell
Curtain-ring....W. H. Edsall
Cushion....E. G. Budd
Cushion-wheel....H. Oudinot and C. Putois
Cuspidors and other hydraulic devices, Automatic cut-off for....D. J. Merrick and C. J. Funk
Cutting-machine....P. E. Jaccard
Cycle attachment, Motor-....E. C. Abraham
Cycles, bicycles, &c., Frame for motor-....E. H. Leet and J. E. Stoll
Dampening-machine....G. H. Spansail
Damper-operating device, Automatic....F. H. Muller
Darner, Stocking-....R. T. Thomas
Dental fillings, Making patterns for casting hollow....E. P. Binford
Dental-floss spool....A. J. Holmes
Digging, transplanting plants, and pulling weeds, Implement for....F. L. Whitney
Dining-table, Self-serving....A. S. Williams
Dish-washing machine....R. A. Henry
Disks, Means for piling....H. D. Dodge
Dispensing apparatus....L. J. Moser
Dispensing-tank....M. Zwirman
Display apparatus....S. Newman and H. R. Bothwell
Door-check....J. A. Evans
Door-controlling device....A. L. Noel
Door-operating mechanism, Dump-....F. Seaberg
Door-strike....E. Bommer
Dough-shaper....E. F. Sobers
Draft appliance, Compensating....W. C. White
Drier....S. J. Vernsten
Drill attachment, Ratchet-....A. F. Derrick and R. W. Garrison
Drilling-machine....L. G. Sabbag
Drive-wheel, 2 patents....J. E. Osmer
Driving mechanism....H. F. Watson
Driving-mechanism control....C. B. Stebbins
Dust laying, collecting, or absorbing composition....S. C., D. T., and J. C. Punch
Dust-pan....G. Lotze
Dye, Disazo....C. Heidenreich
Egg-beater....F. J. Larock
Egg-desiccating apparatus....J. M. Hussey
Egg-opener....C. H. Sheldon
Egg-whip....F. L. Gienandt
Electric circuits, Instrument for locating grounds and breaks in....M. J. Myers
Electric controller....W. Walz
Electric furnace for the continuous extraction of zinc from its ores....E. F. Cote and P. R. Pierron
Electric signal....A. F. Dixon
Electric time-switch....G. R. Clark
Electrolytic apparatus....H. H. Bates and F. Adam
Electromagnetic accelerator....C. O. Pearson and A. Sundh
Elevator....J. J. Burns
Ellipsograph....J. P. Kunz, Jr.
End-gate fastener....T. M. Dice
Engine starter, Gas-....G. Buress
Evener and whiffletree coupling....C. A. Hennicke
Excavating-machine....L. P. Clutter
Explosions in subterranean hollows, Preventing....A. B. Steffens
Explosive-engine....L. F. Loftus
Explosive mixtures, Evaporating....F. I. du Pont
Eye-shade....J. A. Blackstock
Fastening device....A. C. and W. D. Olander
Fastening device....W. S. Katzenmeyer
Fastenings, Machine for inserting metallic....M. D. Phelan
Feeder, Boiler-....V. P. McVoy
Fence-post, Metallic....R. Mattice
Fiber-cleaning machine....C. G. Sergeant
Fiber conveying and reversing apparatus....J. K. Toles
Fiber-liberating machine or break....T. G. Saxton
File....T. E. Gill
File and jointer for saws, Side....L. C. Cook
Filter-beds, Apparatus for cleaning....Z. von Wessely
Filter-beds, Cleansing....Z. von Wessely
Filter-press frames, Securing resilient packing in the grooves of metallic....E. Feix
Fire-alarm....B. C. Andrews
Fire-extinguisher....F. E. Blodgett
Fire-shovel and ash-sifter, Combined....I. Portnoy
Firearm....C. F. Lefever
Firearm-sight....L. B. Shepard
Firearms, Automatic safety device for....R. Frommer
Firearms, Trigger-movement for self-loading....D. W. Tomlinson, Jr.
Fireplace andirons and fender....E. and V. T. Yarborough
Fireproof construction....A. Priddle
Fishing-tool....W. S. Boggs
Flagstaff....P. Kocsis
Flanging-head for receptacles....L. C. Krummel
Flat-iron heater....R. W. Roberts
Floor-dressing machine, 2 patents....W. S. Haven
Flour, Treating (reissue)....J. M. Williams
Fluid-brake....W. Heilemann
Fly-paper holder, Sticky-....G. and H. R. La Be
Fly-trap, 2 patents....G. and H. R. Laube
Flying-machine....A. W. H. Warshavsky
Foot-gage....E. S. Bedford
Forms, Apparatus for constructing dress-....L. Lemcke
Freezer....W. M. Milburn
Fuel feeding and regulating apparatus....J. Hutchings
Funnel....J. F. Rugg
Furnace....A. Tomkins
Furnace....H. P. Bobbitt
Furnace-casing ring....G. E. Camp
Furnace products, Treating electric-....A. C. Higgins and G. N. Jeppson
Furnace-top....F. C. Stimmel
Furnaces, Bridge-wall for....G. Warrington and L. D. Lovekin
Furniture, School....F. F. Kohler
Fuse-adjusting device....W. Schwartz and U. Wilck
Gage....W. M. Jones
Game, Astronomical....E. L. Newsome
Game-board, Base-ball....F. De Rocher
Garment-fastener....H. H. Harrison
Garment-supporter....G. C. Biddle
Gas-analyzing apparatus, Automatic....E. H. Peabody
Gas and water, Agitating device for mixing carbonic-acid....L. Caul
Gas-generator....L. C. Gilmore
Gas in buildings, Device to control the reception of....F. Schmidt
Gas-lighting burners, Safety attachment for....H. E. Campbell
Gas-producer....A. Jabs
Gas-regulator, Automatic....G. H. Murray
Gastroscope....M. Sussmann
Gearing....F. Diehl
Gearing....C. L. Robbins
Gearing, Transmission-....W. E. Jenkins
Glass bottles and like articles, Machine for making....A. Philippoteaux
Glass compound and making the same, Water-....R. Eberhard
Glass-fastener....W. T. Mooney
Glass-making machine, Wire-....J. Hastreiter and N. Bleilevens
Glove....C. E. and R. G. Chaddock
Graining device....C. T. Ridgely
Grapple....T. H. Williams
Grate....H. Untiedt
Grinder, Radius-....A. O. Van Dervort
Grinding and polishing machine....W. La Hodny
Grinding-machine....H. B. Nichols
Grinding-machine, Universal....H. B. Nichols
Grinding-mill....C. G. Hamilton
Grinding-mill....G. S. Emerick
Grinding surface or cage....E. H. Frickey
Gun....W. D. Smith
Guns, Flash-light attachment for....W. L. Long
Guy-wire clamp....S. J. Edmiston
Hair-waver....F. W. Lowe
Hammock, Couch-....I. E. Palmer
Hammock-stand....J. Hand
Hammock-stand....J. Hand
Hammock-support....G. H. Buck
Harrow....E. A. Conklin
Harrow....C. W. Olson
Harvester and picker, Bean and peanut....M. P. Calkins
Hasp-fastener....H. L. Lambrecht
Heat-coil....W. L. Coursen
Heater....J. C. Plank and T. E. Fulghum
Heel and top-lift holder....W. C. Stewart
Heel-beading machine....W. C. Stewart and W. H. Hooper
Heel for boots or shoes, Elastic....C. M. Jaggers
Hides, Splitting-machine for stripping off flesh from....A. H. Kehrhahn
Hinge, Wire....F. W. Lowe
Hitch and checking device, Horse....J. T. Doyle
Holster....J. M. Beasley
Hoop-driving machine, Vertical....E. F. Beugler
Horn....A. G. Soistmann
Horse-detacher....H. J. Williamson
Horses and other hoofed animals, Overshoe for....C. H. Bennett
Horses' hoofs for shoeing, Device for preparing....M. B. Haywood
Horseshoe-calk, Detachable....W. H. Cox
Hot-water and steam boiler....H. L. Worden and H. O. Wurmser
Hub and spindle, Combined wheel....T. A. Barnett
Hydraulic brake....F. H. Halstead
Hydropneumatic spring....H. Oudinot and C. Putois
Incubator and brooder, Combined....A. A. and F. B. Skinner
Ingot-turning device....F. B. Carraher
Ingots, Apparatus for the continuous production of....M. Donteur
Ingots, Process and apparatus for making metal....J. F. Monnot
Injector....J. J. C. and R. D. Metcalfe
Ink-well....F. Guttendorf
Insect catcher or paper holder....B. Heller
Insulator....A. G. Dennler
Internal-combustion engine....D. C. Hathaway
Internal-combustion engine....W. E. Nageborn
Ironing-board....J. C. Yeakel
Irrigating-ditch screen....T. A. Powers
Jack....W. B. McCain
Jack....D. F. Vaughan
Jack and locking means therefor....J. A. Gumm
Jets, Construction of....A. G. Ionides
Joint-bar....E. A. Sullivan
Joint connection, Ground-....J. C. Vogel
Journal lubricator, Car-axle-....J. C. Nichol
Kiln....A. H. Yoder
Kilns, Disintegrating and removing annular salamanders in nodulizing- (reissue)....A. Brautigam
Kitchen utensil....A. E. Humphreys
Knife-guard for jointers....L. Spady
Knitting-machine....C. J. Mumford
Knitting-machine stop-motion....B. T. Steber
Knockdown box....C. F. Jenkins
Labels, Means to facilitate the application of paste to....C. Bunch
Ladder, Convertible....J. E. Duncan
Lamp....C. M. Daniels
Lamp, Acetylene-gas....L. B. King
Lamp-globe....C. T. Schrader
Lamp-igniter....W. D. Jones
Lamp, Incandescent....C. H. Crutchfield
Lamps and lanterns, Wick-adjusting mechanism for....J. Kleinberger and R. Stern
Lard or the like, Apparatus for cutting....A. J. A. Bergman
Latch, Gate-....J. Moore
Latch, Spring-....P. P. Bilhorn
Lathe....M. J. Cunningham
Lathe....J. E. Key

Lavatory....B. F. Wheeler
Leather-worker's tool....J. B. Brassard
Lens-positioning instrument....B. F. Clark
Lifting-jack....M. L. Jenkins
Lights, Adjustable hanger for....H. J. Hinds
Line-casting machine, 2 patents..F. C. L. D'Aix
Liquid-separator, Centrifugal....T. Collins and E. L. Hartmann
Loading and unloading apparatus (reissue)....E. E. Barrett
Loading-machine....F. K. Holmsted
Lock....S. Karsz
Lock....J. J. Murphy
Lock....A. and S. Leszczynsky
Locking device....F. H. Selden
Log-handling device....J. G. Stoner
Loom, Circular....R. E. Evenden
Loom, Ribbon-....A. Jandschin and H. Kuny
Loom take-up mechanism....A. E. Rhoades
Looms, Cutting attachment for....P. Clemens and G. H. Repert
Lumber-joining machines, Edging attachment for....B. A. Linderman
Lumber-stacker....H. W. Clark
Mail-bag handler, 2 patents....J. L. Adam
Mail-catcher....S. S. McKeand
Mail-pouch receiving and delivering apparatus for railway-cars and the like....C. W. Broughton
Mantle for gas-burners, Incandescent. M. Weickert
Manure-spreader....T. Brown
Massage apparatus....E. M. Bassler
Massage-machine, Vacuum....N. Lombard
Match and cigarette box, Combined..A. S. Davis
Match-lighter....J. J. Wellingham
Match-safe....J. De Bruin
Match-safe attachment....J. De Bruin
Match-scratcher..J. H. Havecotte and M. Stanley
Match-splint machine. E. J. Sterba and J. H. Birch
Mattress, Invalid's....J. T. Lunn
Measuring attachment for scissors..J. T. Tippery
Measuring fabrics and the like, Apparatus for....S. Jacobsen
Meat-slicing machine....C. J. Lensvelt
Mechanical movement....F. L. Temple
Medicament for diseases of the mucous membrane....W. Loose
Metal-crimping machine....A. Johnston
Metallic tie and rail-fastener....F. A. Ginnil
Metallurgic converter....W. H. Peirce
Meter....F. H. Connet
Milk-warmer....I. Bauer
Mining-machine....H. B. Dierdorff
Mining-transit-center finder....W. A. Berger
Mitten....W. D. Cormey
Moistener....J. H. Bordeaux
Molding-machine....L. L. Rich
Mop-wringer....M. M. Flynn
Motor....G. Keller
Motor....E. H. Herndon
Motor control, Electric-....H. A. Mavor
Motor-control system, 2 patents...T. H. Thomas
Motors, &c., Automatic starting device for explosion-....E. Cantono
Motors, Heating of compressed air for use in....W. H. Sodeau
Mower, Lawn-....A. Berens
Muffler, Exhaust-....J. A. and C. A. Xardell
Musical instruments, Pneumatic relay for automatic....A. W. Lonsdale
Navigators, Tide-set-calculating instrument for....E. Hill, Jr.
Numbering-machine..E. A. Lundvall and W. Olson
Oil-burner....H. F. Arenberg
Oil-burner....C. C. Lillibridge
Oil-burner, Crude-..W. H. Payne and N. M. Rice
Oiling device, Track-....D. F. Robinson
Optical projection of colored images, Apparatus for the....B. Jumeaux
Optometroscope....M. W. Gantt
Ordnance after firing, Cleaning the explosive-chambers of....W. D. Smith
Ore-concentrating table....T. W. Scott
Ore-concentrator....F. D. Melhuish
Ore-separator....F. T. Snyder
Organ, Folding....H. Faber
Organs, pianolas, &c., Pedal attachment for....C. H. La Dew
Oven, Bake-....J. I. Marshall and J. Faulds
Oxygen-making apparatus....G. von Ach
Package for frangible articles....C. F. Jenkin
Padlock....C. A. Lutz
Pail, Milk-....W. L. Brandon
Paper-bag-making machine....W. Fricker
Paper-holder, 2 patents....G. and H. R. Laube
Paper receptacle....C. F. Jenkins
Paper-vessel closure....C. F. Jenkins
Pavement....W. H. Baker
Pebble-mill, 2 patents....M. F. Abbe
Pencil holder and sharpener, Combined. J. H. Allen
Percolator for coffee-urns....J. D. Houck
Percolator, Water-....G. J. Wiggenhorn
Perforating apparatus....F. E. D'Humy
Perforating-machine....E. De Kleist
Phonograph-record tray....J. N. Blackman
Picture apparatus, Safery shutter device for moving-....C. M. Stanley
Picture-frame....R. C. Davison
Pillow cover, Sofa-....F. A. Reilley
Pipe cleaner, Drain-....G. M. Bloom
Pipe-cleaning device....G. F. Whitney
Pipe coupling, Train-....T. C. Brett
Pipe-couplings, Clamping-ring for....F. N. Smith and G. P. Boothe
Pipe-joint....C. Revaillot
Pipe-lines, Expansion-joint for....E. F. Osborne
Pipe-reamer attachment for threaders...G. Reeb
Pipe-supporting device, Adjustable...E. H. Gold
Pistol and rifle, Automatic....W. J. Whiting
Pitch-board....C. E. Lytle
Planetary transmission mechanism..A. P. Brush
Plante negative plates, Treating or impregnating....H. Rodman
Planter and fertilizer-dropper....E. C. Rollins
Planter, Seed-....W. A. Wilson
Plate-drying apparatus....H. C. MacConnell
Platform-support....A. Vandermark
Pliers, Lifting-....F. Johnson
Plow....W. J. Doyle, Jr.
Plow....W. W. Giddens
Pneumatic-despatch-tube apparatus....C. F. Stoddard
Pneumatic-despatch-tube apparatus....C. S. Jennings
Pneumatic-despatch-tube apparatus....I. W. Litchfield
Post-card or display device, Picture...A. S. Spiegel
Post-hole digger....J. M. Hefner
Potato cutter and planter....O. L. Hawk
Powder holder and shaker. M. Marx and J. L. Rude
Press....S. J. Webb
Pressure-regulator....C. H. Bong
Printer's composing-stick....S. H. Bean
Propulsion of submarine boats....C. Del Proposto
Protector, Individual....F. B. Cook
Pump....A. A. Ficener
Pump, Rotary....C. W. Vollmann
Pump, Rotary air and gas....L. H. Rogers
Pump, Steam vacuum-....G. E. Nye
Pumps and blowers, Casing for centrifugal....H. Holzer
Rack....J. Jepsen
Radiator....L. Loziano
Rail-joint....W. P. and S. G. Thomson
Rail-joint....A. L. Stanford
Rail-joint....E. V. Mercer
Rail-joint....M. Raymond
Rail, Tramway-....J. H. Briggs
Railway and like uses, Spike for..W. Ferguson, Jr.
Railway-brake slack-adjuster....H. G. Hamer
Railway draft-gear....R. A. French
Railway draft-gear..R. A. French and L. T. Girdler
Railway-frog....E. Swenberg and R. Enstrom
Railway-frog....W. M. Scott
Railway-frog safety device....J. T. Watson
Railway-switch....A. Anderson
Railway switch, Street-....E. A. Peterson
Railway-tie....J. C. Pearce
Railways, Annunciator for....J. J. Strobel
Range-finder or telemeter. A. Barr and W. Stroud
Rat-trap....L. S. Turnbo
Razor-blade-stropping apparatus....W. Schmidt
Razor, Safety-....F. M. Edmonds
Receptacle....A. Sargent
Receptacle....G. P. Schmidt
Receptacle, Double-ended....H. R. Sargent and F. C. De Reamer
Receptacle for fluids, Non-refillable..J. H. Brown
Receptacle with sprinkler-hole in a cap. E. Meyers
Reciprocating beds, Cushioning mechanism for....C. A. McCain
Refractory brick for metallurgical and other uses..C. E. Pope
Refrigerator....W. N. Amsbury
Refrigerator....E. W. Mitchel
Regenerative furnace....E. Kirchberg
Retort-charging apparatus....C. Eitle
Reversing mechanism, Automatic....E. Einfeldt
Rheostat....R. Head
Rock-drill....W. C. Stephens
Rodents, Composition for eradicating....C. Ellis
Rope-clamp....O. Crosby
Rotary-engine....C. Guyer
Rotary-engine....L. B. Wishaar
Rotary motor....L. P. Stephens
Rubber heel, Interchangeable....F. G. Sherman
Sad-iron, Self-heating....J. Bordas
Saddle-pad....T. I. Morrish
Saddle-pads, Securing means for....T. I. Morrish
Safety-box, Electric....H. A. Fisher
Sander, Cylindrical....O. H. Hayward
Sash-fastener....G. H. Crease-William
Sash-lock....P. F. Nissen
Saw-set....O. R. Taylor
Saw-tooth-setting device....H. B. Foley and F. G. Wright
Scoffold, Adjustable....B. Muller
Scaffold, Painter's....W. W. Wheeler
Scaffolding....D. and L. Barcsai
Scale-pan, Butcher's....J. Feldman
Scrap-bundler....F. Westwood
Screw-driving machine....J. J. W. Kenan
Seal, 2 patents....W. M. Steele
Seat cover, Sanitary toilet....P. Ganzhorn
Seeding-machine....W. L. Paul
Sewing and embroidering machine....R. Cornely
Sewing-machine....A. L. Madison
Sewing-machine....E. L. Bowers
Sewing machine, Shoe-..J. H. and J. B. Ursbruck
Sewing-machine take-up....B. Phillips
Shade-bracket...M. Vosseler and M. Schlenker
Shade-support, Adjustable....J. P. Olson
Sharpener, Tool-....G. W. Burt
Shear-tables, Transfer apparatus for..J. Simpson
Shearing device....T. J. Holden
Sheet-metal folder....J. A. Mason
Shingle-machine....C. J. Brandt
Shipping-case....S. D. Bedell
Ships and other oscillating bodies, Apparatus for minimizing the oscillatory movements of....E. O. Schlick and M. Wurl
Shirt-front....R. W. Springer
Shoe-form....E. C. Wright
Shoe-polisher....H. J. Friedrich
Shoe-polishing stand....E. H. Gernandt
Shoe-pull....T. Ferry
Shoe-turning machine....A. Eppler
Shuttle....P. Gauthier
Sieve....H. F. Frohman
Sign, Illuminated....J. W. Crow
Signaling apparatus, Selective electric..J. B. Coe
Signaling system....O. T. Lademan
Silo....P. R. Jensen
Siphon....F. A. Decker
Skate, Extensible roller-....W. J. Hille
Skirt-gage....N. Lewsen
Skirt-marker....S. S. Moritz
Skirt-marker....S. C. Sell and A. M. Filhour
Slate-picker....W. J. Owens
Sled-brake....W. H. Stevenson
Sled, Dirigible toboggan-runner...R. H. Doughty
Sled, Steerable....F. W. H. Clay
Sleds, Wheel attachment for....O. Fylling
Slicing and cutting machine, Vegetable....H. E. Madden
Slub detecting and removing mechanism....W. E. Morton
Smoke-consumer....W. Acheson
Smoothing-iron....M. Imhoff
Snap-hook, Self-locking....A. B. Doering
Sod-cutting tool....M. Harris
Soldering cord chains. K. F. Ungerer and E. Becker
Soldering device....H. G. Mead
Sole-pressing machine....T. H. A. Holt
Sole-rounding machines, Knife-mounting for....C. P. Stanborn
Sound-record composition....J. W. Aylsworth
Sound-reproducing machine....F. C. Goodale
Sowing machine, Seed-....J. H. Morris
Speed cone and pulley, Change-....W. E. and P. Rowlands
Speed-indicator....J. B. Waring
Speed-regulator....J. E. Whittaker
Speedometer....J. H. Bullard
Spike-puller....D. Smith
Sprag-shaving machine....R. Appleman
Spring system for beds, &c....J. A. Staples
Square, Folding....W. N. Craig
Stacker, Hay-....C. A. Hagadone
Stamping-machine....R. W. Munk
Steady-rest....H. C. McCullough
Steam and liquid pressure regulating device....C. P. McMullen
Steam-boiler....E. F. Edgar
Steam-trap....C. Stickle
Sterilizing attachment for the mouthpieces of speaking instruments....W. Williams
Stirrup....J. Matsek
Stoker, Automatic....J. M. Fleming
Stoker, Mechanical....P. J. Harleman
Storage-receptacle....E. Herrmann
Stove attachment....M. Carney
Stove, Cooking-....H. A. Winterknight
Stove-door....B. A. Baxter
Stoves, Heat-storing attachment for..L. R. Smith
Street-cleaning and conveying machine. B. Valiquet
Street-sprinkler....C. F. Bierbach
Striking-bag....A. J. Austin
Stump-extractor...A. P. Bernin and E. J. Ware
Superheater....H. Gohrig
Support, gage, and marking device, Combined....W. H. Sitton
Surfacing-tool....C. W. Thompson
Table and support....P. E. Joseph
Tag....A. F. Pine
Teaching shooting, Apparatus for...J. A. Martens
Telephone and protective alarm system, Combined....J. G. Nolen
Telephone-box....W. M. Bruce, Jr.
Telephone-system selecting apparatus....C. E. Nicholas
Telephone system, Semi-mechanical. A. M. Bullard
Templet, Cross-section....H. Z. Osborne, Jr.
Thawing device for frozen ground....W. T. Ross
Thistle-eradicator....O. Murk
Thread-protector....B. C. White
Threading-die....M. H. Threadwell
Ticket, Railway-....T. A. Rousseau
Tile-coating machinery....F. E. Goldsmith
Tie-switch....C. A. Mann
Tire, Automobile-....W. J. Bauer
Tire-remover....H. B. Young and R. Palomino
Tires, Detachable rim for pneumatic..P. Petracchi
Tires, Making inner liners for....B. T. Eshelman
Tires, Signal for pneumatic....S. Silverman and J. E. Trahan
Tires, Wheel-rim for pneumatic....G. Haynes
Tires with viscous liquids, Apparatus for filling rubber....A. D. Ray
Toaster, Bread-....F. B. Schuyler
Toaster, Electric (reissue)....W. S. Andrews
Tobacco-smoking pipe....J. Drew
Tongue for quarry-trucks, Detachable draft-....L. W. Statler
Tool....G. A. Barnes
Tool, Combination-....J. Norquist
Tool-rack....M. H. Brede
Tooth, Artificial....J. A. Williams
Toy....J. S. Lester
Toy dumping-cart....H. T. Kingsbury
Traverse-ring....W. H. Edsall
Trees and the like, Apparatus for moving growing....F. W. Taylor and H. Van Duzee
Trolley apparatus....C. O. Jackson
Truck....F. O. Butler
Truck-bolster for railway-cars....H. Pries
Truck, Car-....C. D. Young
Truck, Car-....T. W. Remmers
Truck, Mine-car....W. W. Rosensteel
Trunk and wardrobe, Convertible...S. W. Bonsall
Trunk-handle....C. F. Knapp
Trunk, Wardrobe-....O. Rangnow
Turbine....O. D. H. Bentley
Turpentine-apron....T. H. Stone
Type-mold, Universal....B. F. Bellows
Type-settingmachine....F. McClintock
Type-writer....A. Beyerlen
Type-writing machine....C. B. Yaw
Type-writing machine....A. T. Brown
Type-writing machine....C. D. Rice
Type-writing machine escapement mechanism....A. Schneeloch
Type-writing machine escapement mechanism....E. G. Latta
Type-writing machine ribbon mechanism....O. C. Kavle
Type-writing machine ribbon mechanism....E. G. Latta
Vacuum-cleaner....G. L. Busian
Valve....C. W. Sherburne
Valve....F. N. Connet and A. W. Graham
Valve....S. S. Caskey
Valve....W. J. James
Valve, Automatic drainage-....C. C. Peck
Valve for radiators, Air-....F. W. Leuthesser
Valve for steam-boilers, Feed-....L. D. Mager
Valve for steam-engines, Reversing-....F. L. Fry
Valve-gear for steam-engines....W. M. Evered
Valve, Non-return....E. V. Anderson
Valve-operating mechanism, Automatic. C. Walker
Valve-operating float....W. Briggs
Valve, Reducing-....F. M. Carroll
Valve, Safety-....H. C. McCarty
Valve-seat-grinding machine....J. D. Burns
Valve, Steam safety-....M. A. Hudson
Valves, Time mechanism for operating gas and other....V. H. Slinack
Vapor-burning apparatus....J. H. Miess
Vegetable and pastry cutter, Combined....R. M. and E. J. Spence
Vehicle-bodies, Mounting or suspension of....C. W. Fulton
Vehicle-brake....F. A. Eigenmann
Vehicle-coupling device....W. J. Kramer, Jr.
Vehicle driving-gear, Motor-....A. R. Corrington
Vehicle, Motor-...W. S. Hovey and C. B. Stebbins
Vehicle-shield....J. Hadka
Vehicle shock-absorber, 5 patents...F. G. Koehler
Vehicle-wheel....W. J. Bauer
Vehicle-wheel....F. P. Vaughan
Vehicle, Wheeled....R. Wolfe
Vehicles, air-ships, &c., Controlling device for....G. F. Larkin
Vehicles, Combined whip, rein, and lap-robe lock for....O. W. Wilde
Vehicles, Draft appliance for self-propelled....D. Dunlap
Vending-machine coin-chute mechanism....M. B. Mills
Vending-machine lock....S. E. Wilmore
Ventilator....A. M. Arnesen
Vessels for facilitating the location and raising of of vessels when sunk, Attachment for....R. W. Ramsden
Voting-machine, 2 patents....J. H. McElroy
Vulcanizing-mold....P. W. Litchfield
Wagon-brake, Automatic....C. Garver
Wagon, Farm-....C. H. Mickelsen
Wagon-rack standard....L. P. Cook
Wagon running-gear....W. J. Ott
Warp-casing apparatus....O. Fischer
Walls, &c., Construction of supports for building-....J. Breuchaud
Washboiler attachment....A. J. Brady
Washer and gasket cutter....J. A. Rose
Washing-machine....A. W. Shank
Washing-machine....N. Lombard
Washing-machine....A. F. Amelung
Washing-machine driving mechanism..K. E. Bills
Waste, Recovering materials from...W. H. Allen
Watch, Alarm-....J. B. Connolly
Watch winding and setting mechanism...E. Hart
Water-closet outlet connection....C. H. Moore
Water-closet tank....G. H. Bailey
Weighing-machine....G. L. Cochius
Well-driller's fishing-tool....M. L. Thorn and W. M. McGee
Wheat-scouring machine....M. Schiebendreen
Wheel....D. H. Allen
Wheel rim, Motor-car-....D. C. Smith and W. F. Gorton
Wheel rim, Vehicle-....J. M. Alderfer
Wheels, Antiskid attachment for vehicle-....T. T. Chaloner
Wheelbarrow....H. J. Spangler
Wheelbarrow with weighing device, Bag-....H. Lange
Whip socket and lock....C. Turney
Window-guard....J. Treu and K. Schaefer
Window-lock....I. C. Scudder
Window-opener....H. Morris
Wire-blocks, Mechanism for operating..J. H. Reece
Wood-barking apparatus....G. Spaak
Wrench....R. Miller, Jr.
Wrench....W. O. Stanley
Wrench....J. W. Sullivan
Wringer support, Clothes-....C. H. Letterman
Yarn-reel for reeling-machines and winding-machines....J. Schweiter

DESIGNS.

Badge....E. L. Haynes
Cup or similar article....I. J. F. King
Display-case attachment....M. A. Skall
Fabric for mats....E. A. Benedict
Fabric for window-shades or similar articles....A. A. Boeck
Screw....W. E. Stevens
Statuette....M. E. Yeaton
Vehicle-body....W. H. Emond

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MECHANICAL PATENTS.

Adjustable bracket....J. H. Lindberg
Aerial machine....W. E. Goble
Agricultural implement....W. Hoover and E. C. Gates
Agricultural implement, Tool-controlling mechanism for....W. H. Rice
Air-brake, Automatic....W. V. Turner
Air-pressure indicator....H. W. and G. H. Brown
Air-switch....C. F. Preslar
Alarm apparatus, Switch mechanism for electrical....A. V. Striat
Amalgamator....C. R. Hotchkiss
Ammonia from gas, Obtaining....H. Koppers
Amusement purposes, Pit for....H. N. Ridgway
Anchor....H. Fuchs
Antisiphon-trap....G. W. Smith
Antiskidding device....E. B. Stimpson
Apron and overalls, Combination..J. E. Richards
Ash-sprinkler....B. Block
Atomizer....F. C. Dorment
Audiphone-receiver....C. E. Williams
Audiphone-transmitter, Portable...C. E. Williams
Auger, Expansion-....J. W. Caldwell
Auger-handle....G. W. Foorman
Automobile....C. Berg
Automobiles and the like, Mouthpiece of horns for....L. A. Bretonneau
Awning....H. Smith
Axle....W. M. Nash
Axles, Device for laying off wooden. G. W. Golding
Bag-holder....F. C. Vonderahe, Jr.
Bag or purse frame....H. E. Nock
Balance, Specific-gravity....B. R. Jolly
Baling-press....J. S. Tuttle
Ball and like game, Base-....P. P. Garbarino
Bank, Savings-....F. Rhode
Basket-handing machine....F. A. Haberle
Bath-tub....S. F. Williams
Battery cells, Mechanical construction of storage-....P. Kennedy
Bearing, Conical pivot-....A. F. Fletcher
Bed, Invalid-....R. L. Edgcombe
Bed or cot, Invalid....G. McElveen
Beehive....J. Toth
Bee-trap....J. Nichols
Belt and hook uniter....R. R. Milas
Belt-tightener....J. H. Hey
Berth-guard....M. Schlesinger
Bias-band folder....I. L. Yost
Bicycle-support....H. P. Price
Billiard-table, pool-table, &c....H. G. Barrett
Billing and journal sheet, Combined....J. W. Hartley
Binder, Loose-leaf....A. Benson
Bit-chuck and bit....M. Hardsocg
Blade-mounting means....C. E. Sweet
Boat salvage device....G. Salles
Body-brace....J. U. Adams
Boiler casing, Water-tube-....J. Suck
Boiler-flue scraper....H. Smith
Boiler water-level indicator....J. J. Dewey
Bolt and nut lock for connecting-rods. M. W. Smith
Book-holder....E. S. Antisdale
Book-rack....T. E. Layton
Boot and shoe tree. T. G. Stevens and C. Wakefield
Boot-treeing machine....H. H. Cummings
Boots and shoes, Ventilating-oversock for....H. M. Guenther
Bottle attachment....E. W. Becker
Bottle-box....M. F. Flynn
Bottle, Milk-....T. L. Camier
Bottle, Non-refillable....J. T. Holtforth and E. T. Remisch
Bottle, Non-refillable....D. A. Hoyer
Bottle, Non-refillable....C. V. Shaw
Bottles and the like, Combined holder and protector for milk-....D. F. Jones
Bottles, jars, &c., Closure for....L. J. Campbell
Box....R. E. Eve
Box construction....H. W. Hildebrand, Jr.
Brake-shoe....J. E. Osmer
Brick-driers, Steam-distributing apparatus for....E. H. Callaway
Brick-machine....R. F. Ollmann

Brooder....A. P. Ward
Brush....G. Lange
Brush and means for automatically cleaning the same, Stripping-....W., T. W. H., and P. C. Philipson
Buffer, Friction-....J. Nichols
Buffing or polishing wheel....F. M. Levett
Builder's jaek....G. W. Hause
Cabinet, Roller-towel....A. Allen
Cabinet, Rural-carrier's....C. A. Boyer
Cable-lubricator....W. F. Slaughter
Cable-traveler....J. E. Magner
Calculating-machine. W. P. Quentell and F. Judge
Can-feeding device....W. L. Wight
Can-packing apparatus....F. J. Heybach
Can-roller, Mechanical....M. D. Blakeslee
Can stopper attachment....W. S. Van Sant
Can-testing machine....C. B. and C. D. McDonald
Candies with sugar, Apparatus for coating....C. H. Wild and C. Mahan
Car adapted for subway use....A. B. De Pont
Car-body underframe....M. M. Schneider
Car construction....H. H. Adams
Car-door....J. Warnock and G. C. Lewis
Car door, Grain-....W. S. Driskell
Car-fender....G. A. Parmenter
Car-step....C. E. Hedgepeth
Car Wheel, mine. . J. T. Parker and M. T. Davis, Jr.
Cars, Carline for box-....T. De Vinney
Carbureter....G. M. Holley
Carriage-curtains, Appliance for cutting prong-receiving slits in....F. S. Carr
Carrier....J. C. H. Gerst
Carriers, Stop for overhead....A. H. Neller
Carrying apparatus....A. C. Smith
Casket-handle....E. R. Sargent
Casting ingots....W. H. Connell
Catching and supporting device, Automatic....J. J. Scicluna
Cement-kiln, Multitubular....H. L. Doherty
Cement, Process of and apparatus for burning....H. L. Doherty
Centering-machine....A. A. and A. J. Anthony
Centrifugal separator....J. W. Phillips
Chafing-dish stand....G. E. Savage
Chain, Cutter-....N. D. Levin
Cross-slides, Mechanism for actuating....B. M. W. Hanson
Chair....M. Anthony
Chair....L. G. Fullam
Chair head-rest, Barber's-....G. W. Gosser
Check-pad and pencil-holder, Combined....C. T. Raschick
Chuck, Lathe-....G. J. Blum
Churn....P. E. Marugg
Churn....J. E. and T. G. Taylor
Cigar-tip cutter....E. Oldenbusch
Circuit-controlling mechanism....C. H. Moores
Clay products, Carrier for green-....T. Louden
Cleaning apparatus, Vacuum....C. R. Pollard
Clock, Automatically-plumbed....J. Ogawa
Clock-ratchets, Forming....F. R. Alford
Clocks, Motor device for electric....J. Granz
Cloth-pilling machine....H. A. Shields
Clothes-clamp....R. W. Glass
Clothes-drier....W. L. Gustafson
Clothes-line Extension Device....H. L. Maynes
Clothes-line holder....F. O. Nitch
Clothes-pin....L. L. Goheen
Cluteh (reissue)....E. C. Smith
Cluteh....H. M. Barber
Clutch....W. E. Knoell
Cluteh....H. E. Marshall
Clutch for drill-feeds, Safety-....R. Milne
Cluteh Friction-....A. Soderling
Coal-dust from coal-breakers, Apparatus for exhausting....W. S. Carpenter
Coal-washing....J. R. Campbell
Coke-oven walls, Preventing the destruction of....H. Koppers
Collar....P. E. Heery
Collar-attaching device....D. Marinsky
Collar-support (reissue)....G. Keitel
Commode or seat, Portable folding....C. A. Conrad
Commutators or collecting rings, Device for grinding....W. Gerb
Concrete articles, Manufacturing....J. Rogers
Concrete-mixing machine....H. C. Fitzke
Concrete-wall mold, 2 patents....D. H. Magliel
Conveyer....W. M. Schwartz
Conveyer....J. A. Svenson
Cooking Utensil....A. H. Merrill
Cooking-utensil handle....J. H. Wilson
Corn-husker....G. F. Koch
Corn sorter, Seed-....O. L. Larson
Cow-tail holder....A. A. C. Fahlstrom and W. Richards
Cross-slides, Mechanism for actuating....B. M. W. Hanson
Crushing-jaw....W. Brinton
Cuff-holder....E. M. Johnson
Cuff-pin....F. E. Farnham
Cultivator....T. D. Heath
Cultivator lever mechanism....F. M. Ashe
Curbing....J. Firth
Curtain-poles and shade-rollers, Bracket for supporting....A. S. Debose
Curtain-support, Vertically-adjustable....T. O. Grills
Cutting-tool....W. Smith
Dental chair....F. Ritter
Dental scraper....C. P. Fritz
Diagram, Train and other....R. Tomlinson
Disinfectant-distributing apparatus....J. W. Wilkie and R. Wilson
Disinfecting apparatus....L. Wieden
Dispensing-can....F. M. Ashe
Display-rack....R. J. Smith
Display stand, Revolver-....W. G. Greenwood
Displaying merchandise, Device for. . J. S. Binford
Door-check....R. W. Hubbard
Door-lock....J. Jenks
Door mechanism....J. Pearson
Door, Metallic....C. Dahlstrom
Door-securer....C. W. Lent
Draft-gear, Friction....J. F. Courson
Draw-bar....S. W. Beeson
Drawing-press....W. Klocke
Drills, &c., Adjustable holder for. . F.E.Bocorselski
Driving-gear, Differential (reissue). L. E. Hoffman
Dust-separator....H. D. Webb and N. Baxter
Egg-carrier....H. S. Jenne
Electric fixtures and the like, Hanger for....V. Bagley
Electric machine, Dynamo-....E. M. Tingley
Electric switch....F. E. Hilliard
Electrical receptacle and mounting therefor....F. J. Russell
Electric time-switch mechanism. . W. C. Blundell
Electrical switch....W. T. Arndt
Electrode support, Battery-....C. B. Schoenmehl and W. Straw
Electrolytic apparatus. . J.H.Monge and C.Arzano
Electromagnet....L. Connell, Jr.
Electromagnetic wave energy, Aerial for the transmission and reception of....R. Pfund
Elevator....A. S. Gooch
Engine coupling, Traction-....F. M. Beydler and H. K. Kinney
Engine indicators, Reducing-wheel for steam-....P. W. Craig
Engine starter, Gas-....G. L. Odenbrett
Envelop-machine....S. A. Grant
Envelop-machine, Rotary....C. de Lukacsevics
Eraser....T. H. Costello
Evaporating apparatus, Liquid-....P. Thelen and J. B. Speed
Excavating apparatus....J. J. Prendergast
Exhaust-silencer....E. A. and F. G. Hall, Jr.
Expansion-bolt....J. L. Mohun
Explosive mixtures, Apparatus for evaporating....F. I. du Pont
Fabric, Machine for making composite....E. Strauss and W. B. Erskine
Fan-muffler....D. F. Leary
Fastener-inserting machines, Work-gage for....F. F. Eno
Fastening device....E. I. Braddock
Fastening machines, Work-support for metallic-....M. D. Phelan
Feed-arresting device....B. M. W. Hanson
Feed-bag....H. B., A., and L. Drosin
Feed-trough....J. F. Merrill
Fence-post....F. Schlegel
Ferrule or protector for tool-handles. . R. Bramley
Fertilizer-distributer (reissue)....E. C. Smith
Fibrous plants, Treating....G. R. de Montlord
File, Receipt-....T. P. Allen
Filing-cabinet....G. S. Upshaw
Filter....H. P. Strahl
Filtering-machine....G. Ridgway
Filtering mediums and the like, Cleansing....J. Wilson
Finger-ring....N. W. Moodey
Firearm....A. Fyrberg
Firearm, Recoiling-barrel....T. C. Johnson
Firearm-sight....W. Bernard
Fire-escape....C. W. L. Martinberg
Fire-extinguishing apparatus, Pressure-compensating device for the air inclosed in....K. Schmidt
Fish-hook, Concealed....A. B. Hanel
Flax-treating apparatus....G. R. de Montlord
Fluid-pressure engine. J. Llein and A. Friederichs
Fluids, Gage for determining the velocity of....F. H. Crawford and M. B. Carmody
Flush-tank-operating mechanism....B. O. Tilden
Flushing mechanism for closet-tanks. J. S. Welborn
Folding-seat....J. G. Arter
Foot-guard....S. K. Dunkel
Form, Dress....R. Rubin
Friction, Device for deminishing sliding. J. Kreiger
Fruit-picker....E. Schultz
Furnaces, Controlling combustion-....G. Bruce
Furnaces, Flue-strip for boiler and other....A. E. Pfahler
Fuse....F. P. Poole and H. U. Badeau
Fuse-box....R. C. Cole
Fuse-igniter....H. Bargman
Fuse-lighter, 2 patents....H. Bargman
Game apparatus....W. L. G. Rumpf
Game-board....F. J. Kraber
Garment-hanger....O. Rangnow
Garter for half-hose....E. Powell
Gas Apparatus for the manufacture of. . A. E. Gow
Gas burner....E. C. Hock
Gas-engine....W. P. Valentin
Gas generator, Acetylene-....O. W. Peterson
Gas machine, Acetylene-....B. F. Holdaway
Gate....F. E. Quigle
Gate-operator....O. O. Bartlow
Gear, Change-speed transmission-....J. M. Worth
Gin-roller....E. L. Peterson
Glandular compound and producing same....J. Takaminer
Glass, Apparatus for manufacture of wire-....A. Shuman
Glass, Method of and apparatus for manufacturing wire-....N. Franzen
Glass, Method of and machine for making wire-, 2 patents....N. Franzen
Glass-plate connector....A. Voigt
Grader, Road-....W. S. Livengood
Grain-drills, Pressure-regulating mechanism for....C. Kearin
Grain, Roasted sulfurized....E. Meyer
Grain-separator....H. A. Campbell
Grate-bar....H. H. and P. McNaughton
Grinding-machine, 4 patents....A. B. Landis
Grinding-machines, Diamonding-tool for....A. B. Landis
Grinding-wheel....G. Hart
Grindstone....J. S. Dreadon
Gun-rod, Telescopic....E. F. Darnell
Hair-dyeing comb....M. E. Waite
Hair-spring gage....G. W. Bowers
Harvester, Beet-....W. Atwood
Hat or cap....J. F. Dodd
Hat-pin....D. Marinsky
Hat-pin....I. Reiness
Hay-cars, Carrier attachment for....W. A. Badger
Hay-tedders, Wind-break attachment for....G. A. Filman
Headlight-adjuster, Automatic....A. B. Brackbill
Hearses, Attachment for....G. B. Webb
Hides, Removing hair from....L. Cheeseman
Hinge, Locke-....M. Woods
Hinge-pin remover....G. W. Bowers
Hoe, Weeding or chopping....T. J. King
Hoisting and automatic load-dumping meehanism....D. O. Jones and G. E. Roberts
Horse leader and backer, Automatic....L. H. Rouviere
Horseshoe....R. C. Meyers
Horseshoe with elastic bridge covering both ends....E. Schmitz
Hose-nozzle....W. H. Perkins
Hose, Steam-....W. T. Bonner
Hydrocarbon-burner....J. C. Colligan
Ice-cream freezer....J. C. Miller
Ignition apparatus....E. D. Bright
Ingot stripper and charger, Combined. D. Kendall
Ink-well....E. Tannewitz
Insole-reinforcing machine....C. P. Stanbon
Insulator....A. B. Tinsley
Insulator-clamp, 2 patents....J. Blackburn
Internal-combustion engine....S. B. D. Harding
Internal-combustion engine....F. G. Hatch
Internal-combustion engine....W. H. Hollopeter
Jar-holder....O. F. Peterson
Jointers,Feed attachment for hand-....G.D.Trogdon
Knob attachment....W. K. Henry
Lamp for vehicles, Swivel-....J. E. Geary
Lamp-lens....S. S. Wilson
Lamp-socket, Multiple....F. E. Seeley
Lamps, Metallic filament for incandescent....C. Farkas
Lantern-slide carrier....T. Sharlow
Lasting-machine....T. H. Seely
Latch, Door-....F. E. Howard
Lathing and concrete-reinforcing structure, Metallic....H. E. White
Leathers, Machine for forming cup-. . W. F. Smith
Legging....M. Rosenwasser
Level, Folding....A. I. Heistad
Lifting-jack....A. B. Cherry
Lightning-arrester....W. C. Shinn
Line-casting machine....P. T. Dodge
Line-casting machine....J. R. Rogers
Line-casting machines, Distributing mechanism for....R. G. Clark
Linotype-machine....W. J. Rennie
Linotype-machine....W. H. Scharf
Linotype-machine....J. R. Rogers
Linotype-machine, 2 patents....G. D. Hartley
Liquid-fuel burner....H. E. Brett
Liquid-heater, Electric....O. H. Fiddes
Liquid-mixing apparatus....J. Szamek
Liquor, Apparatus for making bisulfite....J. Vollmer and R. S. Talbot
Lock....P. Ziron
Lock-washer....F. G. Kollenberg
Looms, Pick-finder device for....S. S. Jackson
Lubricant-separator....T. J. Waters
Lubricating device....C. D. Parnham
Lubricator....J. Pedersen
Machine-tools, Back-gear for....W. A. Greaves
Magnetic separator....S. Norton
Mail-bag catching and delivering apparatus....J. N. Isenberger
Mail-delivering apparatus, Automatic, 2 patents. .C. U. Greeley
Mail receiving and delivering apparatus....L. P. Harvey
Mailing-box....C. Tatham
Mandolin....A. Mannello
Manicure-buffer....M. C. Tener
Manifolding-pad....H. S. Green
Mat or tread, 2 patents....F. G. McPherson
Match-box, Single-delivery....H. E. Reynolds
Mattress, Pneumatic....N. C. Hinsdale
Mechanical movement, 5 patents. . C. J. Robertson
Merchandise-transfer system....G. Macartney
Metal, Apparatus for recovering material from scrap....S. W. Egbert
Metal-working machine, 2 patents....B. M. W. Hanson
Mineral wool, Manufacturing....T. B. Parkison
Miner's drill....J. L. Cook
Mixing-machine....O. H. Weckesser
Mold....F. W. Hoffmann
Monument or tombstone....J. Ifft
Motor-control system....C. E. Lord
Motor-controller....C. T. Henderson
Mower, Lawn-....C. E. Peterson
Needle-holder....I. M. Brown
Noodles, Making....E. Chong
Nut-adjusting machine....K. S. Beery
Oil-can....F. G. Svetlik
Oil-extracting apparatus....M. Kirshner
Oil mixture....J. J. Fink
Oil-switch....H. P. Ball
Orchard-heater....W. S. Haswell
Ore-roasting furnace....B. Hall
Oven....M. J. Elmer and J. Field
Overhead carrier....W. A. Law
Oxygen, Apparatus for making....C. Ridley
Packing....L. Katzenstein
Packing-case and the like....D. Oppenheimer
Packing for grinding-mills....T. W. Capen
Packing, Metallic....F. Hennebohle
Packing, Piston and rod....A. W. France
Packing, Piston-rod....A. W. France
Padlock....F. Soley
Pail, Dinner-....A. W. Brown
Pail, Dinner-....A. J. Kieckhefer
Paint and varnish removing apparatus. . C. J. Fess
Painted articles, Guard for....C. M. Hacke
Paper-bag machine....D. Appel
Paper-bag machine....J. Rogers
Paper-feeding machine....A. Cole
Pasteurizing liquids, Machine for. . W. J. McKee
Paving, Manufacturing and laying bituminous....J. H. Amies
Peat fiber and its manufacture into paper, &c., Treatment of....L. Franz
Pen, Fountain-....E. E. Morlan
Pencil....E. L. Schmitz
Pencil-extender....C. A. See
Penholder....J. Kelly
Phonograph-record blanks, Manufacture of cylindrical (reissue)....V. M. Harris
Photographic-printing apparatus....W. B. Conaway and C. L. Stevens
Pianoforte action, Upright-....R. Streich
Pianos, Music-roll holder for mechanically-operated....I. B. Smith
Pile-construction device....C. J. Fensom
Pin....J. T. Berger
Pin....J. C. Pettee
Pipe-coupling....J. E. Ward
Pipe coupling, Automatic train-....R. A. Fontaine
Pipes, Wall-box for air-....M. E. Danforth
Piping, Safety device for....J. Koenig
Planter, Corn-....V. F. Pavey
Pliers....C. R. Cousino
Pliers and similar tool....W. A. Bernard
Plow (reissue)....G. C. Avery
Plow....J. A. Hanger
Plow....J. Colome
Plow-foot....J. R. Crenshaw
Plow, Middle-breaker and turning-....J. B. C. Armstrong
Plow, Quack-grass....C. E. Glasspoole
Postal-card shield or cover....I. T. Doxsee
Power from a prime mover to a load, Transmission of....A. C. King and F. Hamer
Presser-foot attachment....M. H. Fogarty
Pressure-burner with compressed mixing-pipe....C. E. Andersson
Printing from engraved plates, Machine for....J. A. Mallon
Projectile....F. Ziegenfuss
Projectiles, Contour-cap for....C. Davis
Propeller....F. C. Gordon
Propeller....S. Yeager
Propeller, Screw-....J. Howden
Propeller, Screw-....P. Kovacs
Propelling device, Ship-....C. C. R. de Carvalho
Propelling water-craft, Means for. ....C. J. Low
Pruning implement....A. H. Bastian
Pulping liquors, Treating "spent". . W. J. Hough
Pulverizer....H. A. Goetz
Pump....C. C. Wakefield
Pump, Condenser-....P. J. Pennings
Pump, Steam-....F. F. Nickel
Pumping machinery, Power-head. . W. P. Barclay
Purse....C. J. Crosgrove
Quilting-frame....M. La Bombard
Rail connection....H. Grass
Rails, Anticreeping device for....B. Wolhaupter
Rails, Contact-shoe for third....F. Lacroix
Railway-brake, Fluid-pressure....C. G. Frey
Railway crosstie, Metallic....O. P. W. Michael
Railway-rail splice, 2 patents....I. N. Prenovich
Railway-rail support....E. J. Clark
Railway-spike....H. Hadler
Railway-spike....W. D. F. Jarviss
Railway-switch....D. A. York
Railway-switch....M. S. Farmer
Railway-switch-operating device. . E. H. Whitaker
Railway-tie....W. T. Brister
Railway-tie, Metallic....E. H. Bell
Railways, Electric bond for....H. P. Brown
Railways, Electric conductor for. . E. W. Enequist
Ratchet-jack....A. F. Lent
Reamer....J. G. Matthews
Reducing-machine....B. M. W. Hanson
Reflector and attachment....H. D'Oiler, Jr.
Refrigerator....T. J. Jackson
Rein-holder....C. Lundby
Rein-support....J. F. Freeland
Resistance-grid....H. W. Cheney
Resistance-grid....B. Haskins
Resistance-grid....N. Wilkinson
Riveting-machine....O. A. Anderson
Road-making machine....A. O. Lombard
Roasting-furnace....G. H. Niles
Rock-drill....L. F. Sleade
Rock-drill....A. Avery
Rolling Plastic Material, Apparatus for....N. Franzen
Rotary engine....W. W. Wheeler
Rotary engine....J. H. Harrison
Rubber fabric, Making....A. D. Warner
Rubber pads for boots and shoes, Means for molding....J. O'Brien
Rubber tubing for tires, &c....A. D. Warner
Sack-holder....F. C. Vonderahe, Jr.
Sacks, Apparatus for covering filled. W. E. Murray
Sad-iron heater....G. C. Lee
Safes, Supporting and releasing mechanism for....A. Ridgley
Sandpaper-applying device....C. C. Sadler
Sash-holder....A. S. Willson
Sash Metal window-....G. H. Forsyth
Sash, Window-....H. Rhoads
Saw and brace, Breast....B. P. Hedderson
Saw-clamp....R. S. Brown
Saw-filing and saw-setting machine. . J. Trunnel
Sawmill-hog....H. G. Dittbenner
Saws, Attachment for endless chain. . E. T. Purser
Saws, Tooth and link for chain....E. T. Purser
Sawing machine, Circular....A. Anderson
Scaffold attachment....E. F. Wendt
Scraper, Road-....S. Griffin
Screw-machine....J. S. Broughton
Sealing machine, Envelop-....H. J. Reynolds
Sealing receptacles, Apparatus for....E. Goltstein
Sealing tins, Apparatus for....A. Wilzin
Secondary battery, 2 patents....W. Morrison
Self-cushioning wheel....G. H. Langton
Sewer-trap....R. C. Hill
Sewing-machine....W. H. Emery
Sewing machine, Buttonhole-....E. B. Allen
Sewing-machine cloth-presser-lifting mechanism....G. M. Eames and J. S. Finch
Sewing-machine shuttle-carrier....J. B. Angove
Shade package, Window-....M. Price
Shafting-collar....N. W. Moodey
Sharpener, Saw-....E. J. Shafer
Sharpening machine, Blade-....F. P. Olds
Sheathing, Metallic....L. J. Berg
Sheet-metal sheets, Machine for trimming blanks for....J. H. Shields
Shelf-bracket, Adjustable. . A. E. and G.B.Peterson
Shipping-box, Collapsible....L. D. Fowler
Shipping box or case....C. Fassnacht
Shock-absorber....J. H. Olten
Shoe-bottom filler....A. Thoma
Shoe-machines, Work-feeding and work-guiding mechanism for....A. A. Wadsworth and F. Shortland
Shoe-shiner....P. W. Noonan
Shoulder-brace....A. Roland
Shoulder-brace....J. J. Schilderink
Shovels, spades, forks, and the like, Handle for. .B. Buzzard
Signal....R. C. Spoor
Singeing-machines, Stripping device for....G. W. Stevenson
Single-trigger mechanism....V. C. Hodges
Sink or the like....C. C. Hardman
Skate, Convertible....A. Anderson
Sled and boat, Convertible....J. and E. Enebo
Sleigh, Automobile....G. W. Deviov
Slicing-machine....F. P. Burkhardt
Smelting-furnace....M. Hikec
Smoke-preventing device....J. R. Morton and W. S. Stoddard
Smoke-stack....P. Dickinson
Snow-melting apparatus....M. Jonasson
Soap, Cake of....C. H. J. Dilg and J. O. Fowler
Sole, Shoe-....W. T. Conway
Spacing-table, Graduated....T. V. Boyle
Spark plug and eoil, Combined....E. S. Lincoln
Sparker or igniter....W. C. Westaway
Spectacles....E. W. Beebe
Speed-changing mechanism....R. Symmonds
Speed-meter....R. Johnson
Sphygmomanometer....M. Herz
Spinning artificial threads and the like, Producing solutions for....R. Linkmeyer
Spool-holder, Factory....A. S. Nichols
Spout, Detachable pouring-....H. A. Searle
Sprayer for glue, paint, &c....H. Mikorey
Spring....C.A.Lieb
Square, Caliper-....R. B. Ware
Square or gaging device....J. T. Blair
Stairway, Counterbalanced....O. C. Fosselman
Stalk cutter, Cotton-....P. C. Hallmark
Stamp-mill mortar, Ore-....P. H. Nissen
Stamp, Time-....C. S. Ellis
Stapling-machine....J. L. Firm
Stapling mechanism....J. L. Firm
Steam-boiler....C. A. Sturm
Steam or hot-air apparatus....R. Mayer
Steam-tramper....F. Phelps
Stencil-duplicating apparatus, 4 patents. A. B. Dick

Stereoscope....T. J. Stockdale
Stereotype-casting box....H. F. Bechman
Stirrup....J. Harmon
Stitches, Forming chain-....T. G. Plant
Stoker, Automatic mechanical....L. A. Mapel
Stoker, Mechanical....H. J. C. Gieseke
Storage battery....P. M. Marko
Stove, Hot-blast....W. O. Amsler
Strain-resisting mechanism....G. H. Forsyth
Stringed instruments, Tailpiece for....J. Lindsey
Sulfur, Apparatus for recovering....P. S. Smith
Sulfur from sulfur-bearing gases, Apparatus for recovering....P. S. Smith
Supplemental wheel....M. D. Stocking
Surgical forceps....A. F. Sether
Swingletree-clip or trace-fastener....B. Whetsell
Switch-stand....C. W. Reinoehl and C. W. Long
Switch-throwing apparatus....T. Teply
Switch-throwing mechanism....H. Shemwell
Syringe case, Hypodermic-....S. S. S. Campbell
Tabulating systems, Registering apparatus for....H. Hollerith
Talking-machine (reissue)....E. R. Johnson
Tap....W. Goodwin
Target, Field-firing or surprise....R. T. Gates
Teapot....A. Hering
Telegraphy stations, System of directed reception for wireless-....E. Bellini and A. Tosi
Telephone instrument, Combination..A. I. Sohm
Telephone pay-station, Automatic....F. X. Bee
Telephone Transmitter....S. A. Duvall
Telephone-transmitter, Multiple....F. W. Wood
Telephone, Trick-....E. De Moulin
Tensioning device, Belt-....F. Windhoff
Tensioning device particularly applicable to clutches, Automatic....J. E. I. Bandoux
Threshing Machine, feeding Attachment....K. E. Ose
Thread or yarn cleaning device....R. H. Cook
Threshing-machine-separator screen..N.N.Nelson
Throttle-closing and brake-controlling device, Automatic....S. T. Nelson, H. B. Halvorsen, and F. A. Halleck
Tie-plate and rail-spacing device..J. Klinkhammer
Time-recorder....J. Morrison
Tire....H. Davis
Tire....B. W. Meredith and O. Wildman
Tire, Automobile-....I. B. Kempshall
Tire-protector....J. C. Warring
Tire, Vehicle-....E. P. White
Tobacco cutter, Plug-....J. H. Bassett
Tobacco-packet and apparatus for charging pipes from same....B. Baron
Tobacco-spearing machine....C. M. Gullickson
Toilet-box....D. Niemand
Tool-holder....J. Burt
Tool-holder, 2 patents....G. A. Barnes
Tool-holder, Reversible....R. Hedstrom
Tool holding and display rack, Ball-bearing....J. L. Cofield
Tool, Machine-....W. L. Abate
Top-spinning device....A. Anderson
Toy gun....N. E. Linfahl
Toy gun....J. C. Rotermund
Traction-engine....B. Holt
Trap....G. P. Kidwill
Trick chair....J. Gillespie
Tripping mechanism....P. Vliet
Trolley device, Electrical....L. G. Wilson
Truck, Car-....J. C. Barber
Truck side frame....J. H. McCormick
Trucks, Derailment safety device for railway-....F. Ruckert
Tube cleaner....E. E. Hauer
Tube-cleaner for water-tubes in steam-boilers....E. E. Hauer
Tunneling-machine....L. F. Sleade
Turbine-cylinder lining, Steam-...F. Hodgkinson
Turbine, Elastic-fluid....F. Hodgkinson
Turbines, Rotating baffling device for gas-....B. Sjungstrom
Turn-table center..R. Khuen and A. Reichmann
Turpentine and rosin, Extracting..B. F. A. Saylor
Twine, Machine for making grass....K. Wessel
Type-writers, Convertible spacing mechanism for....W. D. McGill
Type-writing machine....E. A. Goodhue
Type-writing machine....H. C. Ford
Type-writing machine....A. W. Hewitt
Type-writing machine....O. Woodward
Umbrella, Folding....J. M. Minteer
Undergarment-support....O. Johnsen
Utensil and handle....L. S. Lachman
Valve....E. P. Allen
Valve....J. P. Lavigne
Valve and fire-plug box, Street-....E. Prendergast
Valve, Automatic flushing-....A. W. Henkel
Valve, Detector check-....A. Blauvelt
Valve, Emergency-....O. Penn
Valve, Float-....T. D. Millea
Valve, Float-operated....J. S. Welborn
Valve for air-brakes, Automatic triple..A. V. Wester
Valves and other devices, Means for actuating flush-....J. G. Hodgson
Valves, fire-plugs, and the like, Box for street-..E. Prendergast
Vanner....D. K. Allison
Vapor-burner....H. M. Conner
Vegetable-topper....S. Frese
Vehicle....J. Johnston
Vehicle....J. Kelly
Vehicle-chock....T. Scherf and H. W. Merrick
Vehicle-spring....C. A. Lieb
Vehicles, Frictional retarding means for spring-(reissue)....J. M. M. Truffault
Vending-machine....J. N. Karr
Vending-machine, Automatic....J. Levin
Vending-machine, Check-controlled..W. B. Pulver
Vending-machine, Coin-controlled....E. H. Cook
Veneer-machine cutter....S. M. Bush
Ventilator....N. E. Fernandez
Ventilator....G. H. Forsyth
Ventilator....E. T. Scott
Vessels, Fastener for....J. R. Fischer and J. Ditzler
Voting-machine....A. McKenzie
Voting-machine support....A. J. Gillespie
Voting machines, Cumulative-voting interlock for....W. J. Lausterer
Voting-machines, Irregular mechanism of....A. J. Gillespie
Wagon, Advertising-....O. Weniger
Wall, Building-....A. W. Beidler
Walls and the like, Producing jointless material for covering....O. Fauser
Warp-drawing machine....A. P. Dietz
Washboard....C. A. Weirich
Washing-machine....W. J. Delmage
Washing-machine....J. H. Hollingsworth
Washing-machine....C. H. Mallory
Washing-machine, Supply-controller for....S. B. Dane
Watch....F. R. Alford
Water-heater....W. L. Blackwell
Water-motor....C. O. Blanel
Water or like motor or pump....E. Courtright
Water-tube boiler....W. S. Lycan
Watering device, Stock-....W. S. Crum
Weighing apparatus, Liquid- (reissue)..W. Leinert
Weighing device, Infant-....K. B. Hayden
Welding, Electric....M. Lachman
Well-drill machine....R. Anthony
Well heater,Oil-..W. E. Gardner and G.A.Israelson
Well-point, Drive....T. L. Decker
Wheat-heater....J. G. Hagmann
Wheel....E. Bozarth
Whiffletree clip and hook....J. Pierson
Whistle, Boat-....V. Fendrich
Winch....P. W. Sieurin
Windmill....H. S. Bank
Wire-stretcher....J. B. Davis and F. S. Adams
Wires to one another, Method and means for attaching....J. G. D. Mack
Wood, Preserving....J. Chateau and J. Merklen
Woodworking machinery....W. E. Brock
Wrapping and nesting hollow articles, Machine for....F. A. G. Robin
Wrench....G. H. Straight
Writing-position adjuster....C. A. Faust
Yoke for globe suspension....T. H. Costello
Yoke, Globe-....T. H. Costello

DESIGNS.

Bottle....S. Hochstadter
Clock-frame....J. W. Holloway
Light-shade....A. J. Sanford
Spoon, fork, or similar article....G. Strohhaker

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MECHANICAL PATENTS.

Adjusting device....H. D. Chapman
Advertising device, Automatic....B. C. Ferguson
Agitator or mixing apparatus....R. Smith
Air-brake apparatus....N. H. Davis
Air-compressor....C. G. Simonds
Air-drying apparatus....N. H. Davis
Air-drying apparatus....I. H. Reynolds and F. E. Norton
Ammonia, Manufacturing....F. W. Frerichs
Amusement apparatus....A. Bragg
Anvil for steam-hammers....A. Kossel
Armor-plate and other articles of steel..F. Giolitti
Ash-receiving device....W. M. Sharp
Augur, Post-hole....D. W. Looker
Automobile steering and motor-controlling mechanism....C. Schmidt
Awning-fixture....J. Sullivan
Axle, Differential car-....P. P. Cookingham
Axle for railway-cars and locomotives, Differential....C. F. Phillips
Axle, Roller-bearing....M. Wille
Bag-making machine....A. J. Wikander
Baling-press....J. O. Ekleberry
Baling-press....J. S. Tuttle
Baling-press....J. O. Ekleberry
Ball-bearing joint....S. C. Mason
Barrel-heating apparatus....H. F. Marten
Barrette....P. Leger
Bearing, Ball-, 2 patents....E. B. Hess
Bearing, Roller side....J. F. O'Connor
Beater, whipper, mixer, and masher for eggs, cream, vegetables, &c....W. Sturma
Bed-bottom....C. Vallone
Bed joint, Metal....E. W. Adams
Bed, Spring-....L. Clark
Beer-dispensing apparatus....W. A. Wentzell
Bench-clamp....R. J. Colwell
Berths, Curtain attachment for sleeping-car....J. W. Winn
Bicycle-frame....A. Levedahl
Binder, Loose-leaf....R. J. Copeland and A. E. Chatterson
Blacking case, Shoe-....A. Rydquist
Blacking heated iron....G. H. Johnson
Blade holder and sharpener....A. A. Ensminger
Boat....S. C. Johnson
Bobbin machine, Single-thread lace-..E. Krenzler
Boiler-circulating device....F. H. Newhall
Boiler furnace, Steam-....C. H. Knowles
Boiler furnace, Steam-....T. Seevers
Boiler superheater, Steam-....W. Schmidt
Boiler water-gage....T. R. Cook
Bolt washer, Screw-....G. L. Hall
Bottle-capping machine....G. Kirkegaard
Bottles or other vessels, Closing device for....J. E. Fagerstrom, A. E. Johansson, and K. B. Zetterberg.
Bracelet or finger-ring having a variable diameter....P. Doppenschmitt
Brake....E. B. Knowles
Breaking or granulating machine....J. H. Spencer
Broom, Metal-case....S. C. Lay
Brush....P. Bajusz
Brush....R. M. Kelmel
Brush, Metallic....R. Henry
Building-block....F. H. Neuberger
Building-block....O. Brumbaugh
Building-block-trimming machine....F. Koch
Building construction....S.B. Minnich
Building-frame....C. Worthington
Building-work, Process of and apparatus for producing....L. Callahan
Burglar-alarm....J. A. Helquist
Burglar-alarm and telephone system, Combined....J. G. Nolen
Burling-comb....C. Maryns and R. Verlinde
Cabinet, Cotton-sampler's....L. T. Bow
Cabinet, Druggist's....M. P. Schwartz
Cabinet, Spool-....O. and C. Engel
Cables, Machine for armoring...E. Witzenmann
Cake-trimmer....F. Smetana
Calcium carbid, Manufacture of..H. L. Hartenstein
Calculating-machine....J. T. Howieson
Calculating-machine....E. Jalnz
Calender-rollers, Device for the automatic introduction of cloth between....O. Girndt
Candle-shade holder....G. L. Lang
Cap....W. Abrahams
Cap, Sleeping-....A. Brisbane
Car-bolster....E. H. Benners
Car-coupling....E. C. Washburn
Car-fender....O. J. Schmitt
Car lining, Freight-....W. J. Brennan
Car, Passenger electric-railway....F. H. Lincoln
Car-replacer...L. A. Coleman and H. Abrames
Car-roofing, Metallic....J. T. Crawford
Car-seat....F. Hachmann
Car-underframe....C. T. Westlake
Car wheel and axle....B. L. Worthen
Cars and other vehicles, Fender for....J. A. Wiedersheim
Cars, Emergency-exit for suspension-railways....F. O. Butler and S. C. Rockman
Caramel-holder....S. B. Lafean
Carbid and products of same, Manufacturing....H.L.Hartenstein
Carbid, Manufacture of....H. L. Hartenstein
Carbid,Manufacturing, 2 patents..H.L.Hartenstein
Carbon-holder, 2 patents....H. L. Hartenstein
Card-record for manufacturing purposes....H. Zimmerman
Carriages and vehicles, Child's seat for....E. A. Thomas
Cart, Dumping hopper-....P. Haerst
Cash-register, Electric....J. P. Cleal
Caster, Roller-....W. Peet
Catch, Safety-....J. Stamp
Cattle-guard....A. M. White
Cement posts, Wire fastener for....J. L. Settles
Centering device....J. B. Blaw
Centrifugal separator....L. E. Jones
Centrifugal switch....J. B. Wiard
Check for hotels, Guest-....H. Loebl
Checks, Slip-clip for issuing bill-....C. T. Raschick and J. E. Tornquist
Check reins, Safety-hook for side and over....C. L. V. Mundhenk
Churn....A. D. Ramsey
Chute for directing water to current motors, Portable....J. K. Brugler
Chute, Grain-....E. A. Munn and O. L. Plumtree
Cigarette-case....F. J. Palmer
Circuit-breaker....E. M. Hewlett
Clamp....A. R. Peglar
Clock, Secondary electric....T. Mungall
Clothes-drier....H. W. Monk
Clothes-drier, Centrifugal....F. A. Dinsmore
Clothes-pin....R. E. McCreary
Clutch, Friction-....H. Geisenhoner
Clutch, Friction-....W. Runge
Clutch, Reversible....S. Otis
Coal and similar substances, Apparatus for use in loading..E. G. C. L. Meyer and H. F. J. Holst
Coal, Burning powdered....L. S. Hughes
Coal unloading and distributing device..E. S. Hart
Coating compositions, Making....R. D. Powers
Coating metals, Composition for....J. B. Higley and T. F. Ryan
Coin-controlled apparatus....L. W. Luellen
Coke-oven, Vertical-flue....C. Wilke
Coloring-matter, Brown....M. Kahn
Column and making same....A. G. Higgins
Columns, Making artificial-stone or plaster....A. G. Higgins
Commutator-motor, Single-phase....V. A. Fynn
Commutator-truing machine....O. E. Hunt
Composing-machines, Quadding apparatus of typographical....C. Woodroffe, H. Pearce, and J. E. Billington
Composition of matter....R. D. Powers
Concrete post or pole....O. Dougherty
Concrete walls, piers, columns, &c., Sectional mold for forming....J. G. Barnes
Concreter's bolt....B. H. Paugh
Condenser....F. J. Loomis
Condiment-holder....R. Wilson, Jr.
Container-forming machine....J. C. Thompson
Cooking articles, Instrument for indicating the temperature of....J. Nielsen and S. A. C. Kristensen
Cooking utensil....J. F. Milligan
Cord-twisting machine....G. S. Spencer
Cores for worm-gears, Apparatus for making....J. A. Hallander
Cork articles, Treating....G. H. Gillette
Corset, Apparel, 2 patents....D. Kops
Corset-clasp....M. W. Hoffmann
Cotton checker and cultivator, 2 patents....R. Hamilton
Couch, Folding....D. C. Travis
Cradle....C. P. De Bosco
Crate, Folding shipping-....A. Wyss
Cream-separator liner....E. R. Bailey
Culinary-utensil cover....B. N. Reeves
Current motor, Alternate-....V. A. Fynn
Current motor, Alternating-....V. A. Fynn
Current motor and generator, Alternate-....V. A. Fynn
Cut-out....J. G. Swallow
Cycle stand, Motor-....W. S. Harley
Datum and recording sheet....S. T. Park and J. E. Phillips
Desk book-rack, 2 patents....W. B. Updegraff
Desk furniture....A. A. Low
Diaphragm-motor....H. M. Stevens
Die....O. M. Patterson
Directory, Mechanical....F. G. Hall
Dish-lifting device....A. O. Bonin and L. P. Beaulieau
Display apparatus, Card-....C. H. Townsend
Display-shelving....J. N. Clear
Distribution system....C. P. Steinmetz
Doffing mechanism....F. Lister
Door....S. D. Hart and A. Hoefer
Door....N. Paine
Door-hanging device, Sliding-....C. F. Lamphier and M. F. Trenchard
Door-lock....W. H. Thomas
Door-securer....H. Helle
Door, sliding....G. Peterson
Double and swingle tree coupling....S. B. Hazard
Dough-mixing apparatus....H. H. Wilson
Draft-equalizer....F. M. Smiley
Draft-regulator....H. C. Cornwall
Draw-clamp....H. A. Knoke
Drawer-handle....E. W. Lassick and C. F. Mosman
Drawer-support, Extension....W. D. Patterson
Drop-feed lubricator....F. Lowry
Dumb-waiter or lift....S. McCarney and W. J. Zimmerman
Duplex two-pole switch....P. Dunning
Dust-pan....W. D. Chamberlain
Dust-removing apparatus....C. Johnson
Dye, Black azo....O. Gunther, L. Hesse, and A. Zart
Dye, Brown, 2 patents....M. Kahn
Dynamometer...S. T. Park and J. E. Phillips
Dynamometer, Indicating, recording, and integrating....W. J. Crowell, Jr.
Egg-beater....A. C. Poore
Egg-beater....C. A. Nichols
Electric conductors, Connector for...H. G. Weeks
Electric machine, Dynamo-....J. W. Burleigh
Electric charges between solid conductors and gases, Effecting interchange of....F. G. Cottrell
Electric machine, Dynamo-....R. Flagg
Electric system, Vapor....C. P. Steinmetz
Electrical-circuit protector....R. Wiesinger
Electrical-distribution system....A. S. Hubbard
Electrode for vapor electric apparatus....P. H. Thomas
Electrolytic cell....J. L. R. Hayden
Electromagnet....E. Bachelet
Electromagnet....E. A. Burlingame
Electromagnetic device....H. G. Geissinger
Elevated carrier....A. D. Hadsel
Elevators, Storage-carrier for portable..F.T.Byers
Embalming instrument....H. J. Birkenkamp
Embroidery-hoop....W. C. Maynard
Engine-lubricating device, Gas-....F. A. Jahnke
Engine starter, Gas-....F. H. Armstrong
Engines, Automatic throttle-controlling device for....J. W. Briggs
Engines, Safety attachment for hoisting-....A. L. Le Grand
Envelop, Souvenir-....I. F. Farlow
Equalizer....H.F.Brandes
Excavating apparatus....L. A. Desy
Exhaust-head....A. Sorge, Jr.
Explosion-engine....H. Sohnlein
Explosive liquids, Plant for storing....W. Heer
Explosives, Mixing-machine for....H. Talley
Extension-table....J. O. Johnson
Fabrics, Apparatus for the production of leno....J. King
Fan and sunshade, Combined....H. Sprinzel
Faucet and strainer....R. B. Disbrow
Fence-making machine....R. W. Halliday
Fence-post, Metallic....J. W. Altmyer
Fence-wire-reeling apparatus....A. F. Christ
Filling device....H. W. Wardwell
Filter....G. V. Sponenbarger
Filter-pulp washer....L. Sochurek
Fire-escape....W. C. Baird
Fire-extinguisher systems, Automatically-released alarm-box for....J. G. Nolen
Firearm....W. H. Gates
Firearm guard or deflector....H. B. Febiger
Firearm-sight....G. R. Henkel
Fish-trap....J. P. Cleary
Flat-iron....J. Courtenay
Flower-holder....A. Hoffman
Flue-cutter....W. H. Damon
Flushing device....F. F. Hawkins
Folding chair....J. Hajos
Folding or collapsible box, case, and the like....D. Parkins
Fowl, Hardening feet and legs of....F.Jessee
Fruit-gatherer....J. W. Drepperd
Fulcrum-block...H. J. Cox and S. J. Gallagher
Furnace....A. Schmidt
Furnace....R. H. Vondenbosch
Furnace....U. Wedge
Furnace door,Boiler-....M.C.Hawley
Furnace-grate....H. C. Chamberlin
Furnace-regulator....J. A. Kees
Furnace-regulator adjusting means...J. P. Dresp
Furnaces, Automatic draft-regulator for....H. F. Westphal
Furnaces, Blast-pipe for blast-....S. B. Shutts and W. McHugh
Furnaces, Method and means for feeding the trucks in channel-....P. Harden
Furnaces, Rotary grate for....H. E. Wallis
Furniture-clamp....J. W. Connaty
Fuse block, Electrical-....A. A. Moffitt and G. E. Andrews
Gage....W. A. Greavis
Gambrel, Automatic beef-spreader..G. H. Baust
Garment-fastener....J. C. Carter
Gas analysis, Apparatus for....K. W. Bartlett and J. J. Staley
Gas and coal furnace, Combination..F. J. Parker
Gas apparatus....J. F. Kistler
Gas-burner mixer....B. A. Geurink
Gas-fixture....A. Jarmolowsky
Gas generator, Acetylene-....W. A. Ready
Gas-hanger..M. Nuberg, J. Mollien, and F. Boss
Gas-mains, Automatic cut-off for..C. E. Lahmers
Gas-producer....J. R. George
Gas-purifier....S. G. Merrick
Gas-scrubber apparatus....A. M. Gow
Gear-cutting machine....F. J. Spencer and J. Speirs
Gearing, Change-speed....J. H. Apjohn
Gearing, Reduction-, 2 patents....G. W. Melville and J. H. Macalpine
Glass, Device for spinning....I. Weiskopf
Glove, Bricklayer's....B. L. Sprague
Governor, Engine- (reissue)....D. W. Fayne
Grader, Road-....F. A. Mattson
Grain-distributer....C. W. Camp
Grain-dump....W. E. and F. I. Merritt
Grain-growing apparatus....A. W. Grunwaldt
Grain, Means for treating seed-....G. E. Daniels
Grate....J. C. Bartlett
Grate-lock, Automatic....M. J. Tierney
Grease-cup....C. F. Tucker
Grease lubricator....H. S. Blynt
Grinding-disks, Producing....F. N. and F. E. Gardner
Grinding-machine....C. H. Norton, J. C. Spence, and H. N. Cudworth
Grinding-mill....F. B. Canode
Grinding the teeth of gear-wheels, Machine for,....F. A. Phelps
Gun, Recoiling-barrel....T. C. Johnson
Gun-sighting apparatus....C. P. E. Schneider and E. Rimailho
Gyratory crusher....J. B. Rhodes
Hammer....E. A. Keeler
Hammer, Bush-....J. H. Sweetland
Hammer, Electrically-operated....L. Paulero
Hammer, Pneumatic....C. L. Jones
Harness-support....W. W. Dillman
Harrow, Riding-....O. Goodale
Harvester, Cotton-....D. H. Mays
Harvester cutter-bar....G. Bradt
Hay-cocker....R. W. Allison
Heat-radiating device....C. H. Way
Heating apparatus, Steam-....G. P.Campbell
Heating system....B. F. Seymour
Hinge-gage and hinge-seat cutter, Combined....F. J. Ziegler
Hinge, Gravity-....J. A. Stuart
Hoist....E. Y. Moore
Hopper dredger and barge....F. Lobnitz
Horseshoe....F. Clark
Horseshoe....T. L. Hites
Hose-pipe-connection closure....G. R. Chamberlain, A. G. Schroeder, and A. A. McLeod.

Hot-water furnace....D. J. Archer
Hydrocarbon injector-burner....E. J. Achee
Ice-harvester....A. N. Habberley
Icefield-scraper....A. Krajeck
Illuminating system....C. P. Steinmetz
Impression apparatus....L. Huffman
Indexing, Book-....C. H. Drake
Internal-combustion engine....H. H. Simon
Internal-combustion engine....A. A. Low and H. Hertzberg
Iron or steel, Treatment of....W. R. Hodgkinson
Jack for repair-shops....G. W. Pond
Jar-closure....E. C. Hill
Joint-cover....A. G. Williams
Journal-box....G. W. Lewis
Journal-box-lid fastener....T. H. Joye
Journal-box-lubricating device....C. B. Coon
Junction-box....T. E. Murray
Keyboard-operating mechanism....H. Knudsen and H. Barta
Key-fastener....C. O. Shaub
Key receptacle and chain, Combined....A. H. Field
Kiln, 4 patents....T. M. Wilson
Label, Bottle-....I. Levi
Lace, Machine for producing braided or plaited....H. Buscher
Lamp, Arc-....C. E. Harthan and W. H. Dalton
Lamp, Arc-....W. D. Ryan
Lamp box, Carriage-....R. E. Cole
Lamp-burner....R. V. Buchanan
Lamp, Incandescent petroleum-....M. Malkiel
Lamps, Adjustable support for vapor-....S. E. Flichtner
Lamps, Apparatus for exhausting incandescent....F. L. O. Wadsworth
Lamps, Carbon-feeding mechanism for arc-....L. O. Kozar
Lamps, Obtaining metallic attachments for incandescent....P. Azaria
Lamps, Pull-socket for incandescent....H. T. Paiste
Last, Shoe-....A. G. Legg
Latch, Gate-....G. S. Mitchell
Lathe, Turret-....F. K. Hendrickson
Laundry-iron, Electric....E. H. Richardson
Lawn-sprinkler....E. P. Krider
Ledger, Loose-leaf....C. A. Hofstetter
Lettering device....W. M. Black and A. P. Morris
Levee-builder....D. J. La Bauve
Level for measuring angles and inclinations, Spirit-....A. Stauffer
Life-preserver....J. Ellendman
Lightning-arrester....P. H. Thomas
Liquid-heating apparatus....P. T. Arduino
Liquids from barrels into storage-receptacles, Apparatus for discharging....R. Hausdorf
Loading-machine....G. Kruse
Lock....C. E. Lowe
Locomotive ash-pan....H. A. Hoke
Locomotive driving-boxes and the like, Liner for....G. Hall
Locomotive-engine....H. S. Vincent
Locomotive-strainer....G. A. Bowman and C. L. Harmeyer
Loom connecting-rod and lubricating device....W. P. Evans
Looms, Lay for narrow-ware....W. Wattie
Lubricator....A. J. Krick and C. E. Thompson
Mail-bag delivery apparatus....G. H. Mueller
Mail-delivery apparatus....J. J. McGrath
Mail-distributing rack....W. A. Carpenter
Mail-pouch receiving and delivering mechanism....J. and B. Frankfort
Mandrel, Piercing-....R. J. Gardiner
Match-box...H. C. Fleming and W. F. Royster
Match-box and cigar-cutter....H. Marriott
Matting-roller....A. E. Shannon
Measuring apparatus....W. W. Nicholas, T. H. Kane, N. A. MacRae, and C. D. Gano.
Measuring system and means therefor....A. E. Standen
Mechanical movement....H. J. Andre
Mechanical movement....D. C. Woodworth
Mechanical movement....F. L. Bowles
Merchandising-sample....S. H. Stix
Metal articles, Apparatus for cleaning....J. D. Phillips and C. Hambuechen
Metal articles, Cleaning....J. D. Phillips and C. Hambuechen
Metal plates, Machine for upsetting....C. L. Parmelee
Metallic mold....H. G. Larzelere
Micrometer....D. Peters
Milk-can....T. W. Forster
Milking-machine....R. D. Roth
Mine-shaft safety device....W. H. Gregg
Moistener, Envelop-....J. F. Pomphrey
Mold....J. B. Blaw
Mop....T. Evans
Music-chart, Mechanical....S. B. Turner
Musical-instrument attachment....C. H. Davis
Musical instrument, Automatic, 2 patents....P. Welin
Musical instrument, Mechanical (reissue)....E. S. Votey
Musical instruments, Automatic playing attachment for....P. Welin
Musical instruments, Controlling-lever and fall-board for automatic....P. Welin
Musical instruments, Pedal mechanism for....P. Welin
Musical instruments, Tracker-board for automatic....P. Welin
Musical instruments, Valve for pneumatically-controlled....P. Welin
Name-register....F. W. Leuthesser
Navigator's calculating instrument...E. Hill, Jr.
Necktie....H. Martin
Necktie-holder for negligee shirts....C. K. Ruebe
Needle....F. H. Schomburg
Nest, Interchangeable hen's....H. Boettcher
Nitrocellulose bodies, Making horny...V. Vender
Nozzle-holder....C. F. Mohrhoff
Nut-lock....H. E. Kittredge
Nut-lock....C. W. Reinoehl and B. L. Weaver
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Oil-burner....H. Duke
Oil-burner....J. A. Mahr
Oil or vehicle for paints, colors, and pigments....A. Hahn
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Ore-separator, Magnetic....G. E. Ohrn
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Packing-box....W. L. Cook
Packing-case....A. G. Sherman
Packing for stuffing-boxes....O. Lingner
Packing, Rod-....E. J. Armstrong
Paper-bag machine....F. E. Strasburg
Paper bands, Apparatus for producing combination of holes in....E. Ehrhardt
Paper-folder....L. A. Nichols
Paper-sheet-feed mechanism....F. Giroud
Paper-tube machine....F. C. Osborn
Pasteurizing apparatus....A. A. Pindstofte
Patterns, Laying out....C. F. Shulze
Pedal....A. F. and C. H. Norris
Pen, Fountain-....R. B. Hallock
Pen, Marking-....L. W. Newman
Pencil-holder....E. S. Evenson
Pencil-sharpener....W. S. Beebe
Percolator-overflow....E. A. Gutermann
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Photography, Making screens for color...C. Spath
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Pie-making machine....D. K. Allison
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Plow attachment....J. W. Farrington
Plow jointer attachment....P. S. Sidell
Plug, Attachment-....L. A. G. Widener
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Power-distribution system....W. L. R. Emmet
Pressing-machine...M. H. Schirmer and J. Lehr
Pressure-regulator....J. Kenlon
Primary battery....T. W. Byrne
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Printing device....W. F. Armstrong
Printing-machine, 2 patents....A. B. Dick
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Sawing or felling trees, Machine for...M. L. Fagan
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Scale-illuminating device, Computing-....C. B. Longstreth
Scale, Proportional....N. M. Blair
Scale, Weighing-....J. M. Triner
Scissors....C. N. Wikander
Scissors....F. O. Homme, J. T. Vollen, and I. L. Isaacson
Screen....C. C. Armstrong
Screw-cutting attachment....F. E. Anthony
Screw-seat....C. J. Anderson
Screws, Guard for set-....W. H. Ackermann
Seal....H. E. Irwin
Seal, Car-door....W. Reichert
Seal-fastening, 2 patents....T. E. Murray
Seal for holding knots, Metallic...I. S. Brassington
Seal or packing, Liquid....K. Ahlquist
Sealing and stamp-affixing machine, Envelop-, 2 patents....E. J. Brasseur
Sealing apparatus, Envelop-....E. J. Brasseur
Sealing device for bottles....O. Cardell and S. T. Bergstrom
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Sewing-machine attachment....L. Boyd
Sewing-machine cording attachment...A. P. Day
Sewing-machine, Embroidery or ornamental stitch....W. N. Parkes
Sewing-machine looper mechanism, Hooked-needle....F. W. Merrick
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Sharpening device for blades of lawn-mower knives....W. F. Miller
Sharpening machine, File-....C. M. Emerson
Shearing-machines, Electrically-controlled squaring mechanism for....E. Miles
Sheet-manipulating device....O. S. Beyer
Sheet metal, Finishing galvanized...A. Niedringhaus
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Shirt-sleeve....A. Paradis
Shoe-stretcher....J. C. Grison
Shoulder-brace....E. Nesbitt
Shovel and cifter, Combined....L. H. Chamberlin
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Show-case, Show-window and the like, C. M. Conley
Sifter, Flour-....M. E. Higgins
Sight-feed....J. C. Hill
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Signaling apparatus, Submarine....E. C. Wood and H. G. Marden
Signaling mechanism....F. M. Dewing
Signaling system....J. L. Hall
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Sizing-screen, Revoluble....L. E. Warner
Skate....G. E. Neuberth
Skate, Extensible....W. B. Alden
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Slicer, Vegetable-....J. N. Winans
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Smelting sulfur ores....R. Fleming
Smut-machine....C. Zeitler
Socket-spindle....L. H. Moulthrop
Sound-amplifier....N. Baldwin
Sound-box....G. L. Coleman
Sound-box mounting....G. L. Coleman
Sound-producing device....H. B. Gale
Sound-reproducing-machine cabinet...A. E. Madison
Spark-plug....O. C. Winestock
Speaking-tube attachment....L. E. Gager
Speed mechanism, Variable-....H. W. Schatz
Speedograph, speedometer, and cyclometer, Combination....H. J. Sulzen
Spinning and twisting rings, Holding means for....A. C. Rhodes
Spinning and weaving purposes the vegetable fibers contained in straw, grasses, bast, harl, and the like, Process of opening for...F. A. Reichmann
Spinning device....W. B. Gilmore
Spinning-machine....F. S. Culver
Spinning-rings, Means for retaining and delivering travelers for....L. S. Burbank
Spring-switch....A. R. Murray
Spring-wheel for vehicles....W. Ackerman
Stamp-affixing machine....W. L. Bowlus
Stamping and sealing device....W. C. Pratt and A. J. Pates
Staples, Power-operated machine for setting....W. E. Elliott
Staples, Treadle-operated machine for setting....W. E. Elliott
Steam-engine....E. J. Armstrong
Steel shovel, Pressed-....W. I. Judy
Steel, Transferring dephosphorized molten....R. H. Wolff
Stereopticon-carrier....H. W. Force
Stereoscope and stereograph, Panoramic....E. P. Croker
Stereotype-plate-casting machine....H. Lang
Stereotype-plate-casting machine....J. J. Walser
Stereotype-plate-casting mechanism....J. Walser
Still....W. K. Wilson and J. Wallbillich
Stone walks, Form for laying artificial...S. C. Smith
Stop-motion for velvet and like pile cutting machines...W. G. M. Keighley and H. Netherwood
Stopper-fastener....B. Donohoe
Stove....J. B. Barrett
Stovepipe-cleaner....C. T. Harms
Structure, Interlocking sectional....H. G. Conrad
Stuffing-box....G. Strance, R. S. Bull, and W. P. Norris
Sun-dial....W. M. Homan
Switch and lightning-arrester, Combination....S. W. Wood and E. T. Thoma
Switch construction....W. M. Scott
Switch-handle....C. E. Anderson
Synchronizing apparatus....G. P. McDonnell
Syringe....T. R. McNerthney
Table....O. Holmes
Tailor's appliance....A. T. Rowe
Tailor's fitting apparatus....J. Augsten
Talking-machine....E. R. Johnson
Talking-machines, Valve for the sound-boxes of....C. K. Simpson
Tanning machinery....G. C. Vogel and C. P. Bossert
Target-trap....W. H. Hiestand
Telegraphic transmitter, Keyboard....E. E. Kleinschmidt
Telegraphy, Space, 3 patents....J. S. Stone
Telephone adjunct....A. Rector
Telephone-line apparatus....C. D. Enochs
Telephone lock-out device...C. W. Throckmorton
Telephone meter system and apparatus, 3 patents....R. H. Manson
Telephone transmitter and receiver or testing instrument, Portable....H. F. Thoma, Jr., and C. E. McGrew
Tension device....S. W. Wardwell
Thread machines, Roll for wool-....C. S. Snyder
Ticket-holder....H. P. Dooley
Ticket-seller....K. Hepper
Tie and lumber hook....H. T. Peterson
Tile-coating machines, Feed mechanism for....J. P. Scovill
Tile, Roofing-....R. D. Watson
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Tire-heating device, Drive-wheel-....J. A. Mahr
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Tongs, Pipe-...J. A. Gillespie and M. J. Corey
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Tubes, Apparatus for making metal-cased....G. W. Earle and A. Bourne
Turbine....A. Boeckel, O. Grunberg, J. Korwin-Krukovsky, and E. Luxembourg.
Turbine, 5 patents....W. Robinson
Turbine driving auxiliary apparatus...A. H. Kruesi
Turbine, Elastic-fluid....C. G. Curtis
Turbine, Elastic-fluid....H. Geisenhoner
Type-distributing apparatus....L. K. Johnson and A. A. Low
Type-setting machine....H. M. Freck
Type-writer attachment....D. F. Maher
Type-writers, Dead-key mechanism for....T. L. Knapp
Type-writing machine...A. F. W. J. von Wedel
Type-writing machine....O. Woodward
Type-writing machine....C. B. Yaw
Type-writing machine....H. W. Higham
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Type-writing machine....L. S. Hopley
Type-writing-machine tabulator....W. E. Mark
Type-writing stand....C. E. Goulding
Twine-cutter....G. H. Colebeck
Umbrella, 2 patents....G. K. Garrett
Umbrella, hat, or like support....E. C. Leonard
Undergarment, Combination-....L. M. Kugel
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Unloading apparatus....F. S. Snyder and A. F. Burt
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Valve, Regulated automatic-closing....J. L. Gish
Valve, Steam-engine....E. J. Armstrong
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Vehicle-wheel....B. P. Cooper
Velocipede....M. Slotkin
Vessels, Device for locating sunken....C. Vroman and F. L. Hamilton
Veterinary impregnating instrument...C. W. Baird
Vibrator....A. J. Stecker
Voting-machines, Card-holder for....E. Mattoon
Wagon, Self-loading....G. M. Forbess
Waiting-stand for dining-tables...B. F. MacMinn
Wall, Reinforced partition-....E. Flagg
Wardrobes, Garment-support for....M. B. Chandler and M. Oosdyke
Warping-machine....C. A. Steere
Washing-machine attachment for stationary wash-tubs....W. Walton, Jr.
Washing-machine cylinder....J. R. Golter
Washing-machine-operating mechanism...J. Edens
Watchcase-bows, Forming....J. Ullberg and B. Levy
Watch-movement....W. B. Mehl
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Water-gage....H. C. Burns
Water-heater....A. E. and A. S. Higley
Water-meter, Self-registering....F. W. Hanna
Water-motor....A. Bratschie
Water, Treating and storing....W. A. Powers
Wax, Electrical apparatus for melting sealing-....W. T. von Tillow
Waxing device....H. F. Haussmann
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Weighing and bagging machine, Automatic....J. B. Williams
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Window-screen bracket....F. J. Warner
Window-ventilator....J. O. Barker
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Windows and window-screens, Fastener for storm-....J. Michaelson
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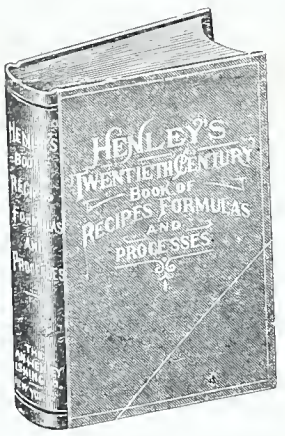

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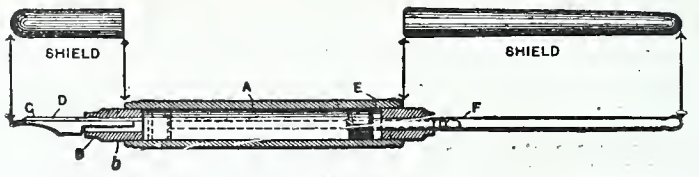

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MINE HAULAGE BY COMPRESSED AIR.

By FRANK C. PERKINS.

COMPRESSED air locomotives have for 20 years been widely utilized in mines in the United States, while in Europe there were only about half a dozen locomotives of this type in service a decade ago. During the past ten years, however, the compressed air haulage has increased in European mines so that there are now several hundred in operation. The compressed air locomotive has found favor especially in American mines with a limited space under ground, and where fire damp is encountered which would make the electric trolley or third rail extremely dangerous. The air locomotive may be seen hauling trains of 20 cars loaded with coal or ore, having a gross weight of more than four tons each.

Where grades are steep and it is impossible to utilize one locomotive large enough for the work, two are connected in tandem as shown in the accompanying illustration (Fig. 3.)

FIG. 1.—COMPRESSED AIR LOCOMOTIVE HAULING TRAINS IN MINE.

FIG. 2.—COMPRESSED AIR LOCOMOTIVE BEING CHARGED.

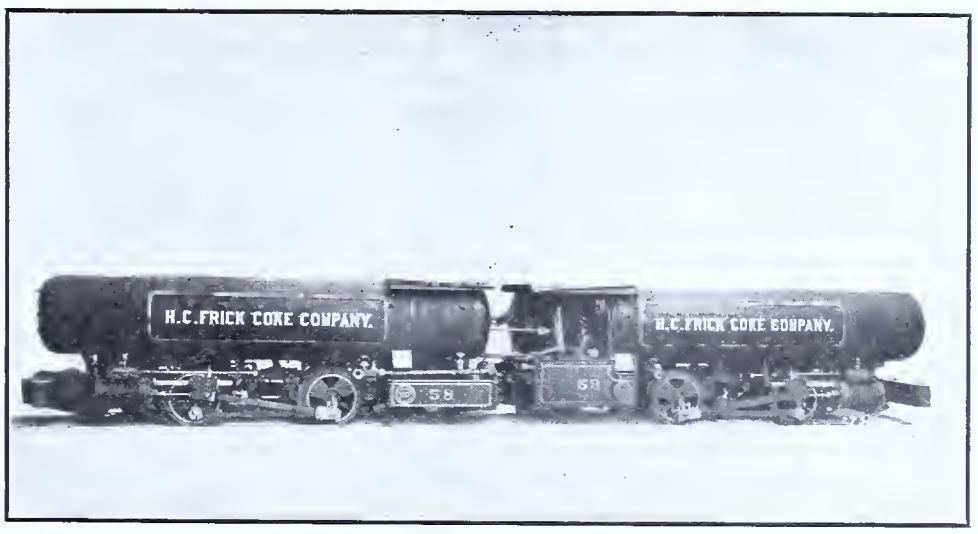


FIG. 3.—COMPRESSED AIR ENGINES IN TANDEM.

These two compressed air locomotives are utilized by the H. C. Frick Coke Company, and were constructed at Philadelphia, Pa., by the Baldwin Locomotive Company. Each weighs 21,000 pounds, and is provided with tanks 31¾ inches in diameter. Each double tank unit has one reservoir, 12 feet 4½ inches long, the other measuring 14 feet 9¼ inches; the storage pressure being 800 pounds and the working pressure 150 pounds per square inch. The cylinders of each unit are 8 inches by 12 inches, and the drivers are 24 inches in diameter, while the wheel base measures 4½ feet. The same company has in operation two double tank locomotives weighing 50,000 pounds for the two, with a combined tractive force of 11,120 pounds.

The engineer sitting in the cab of one locomotive can operate the throttle and reverse lever and sander of both locomotives simultaneously. The cylinders of these engines are 9 x 14 inches, and the two tanks on one locomotive have 140 cubic feet capacity, giving a total of 280 cubic feet storage capacity for both. The height is 5 feet 1½ inches, and the width 6 feet 5½ inches.

The accompanying illustration, Fig. 1. shows a compressed air locomotive hauling a loaded train in the Emscher pits of the Kolner Berg-

werks-Verein, while Fig. 2. shows the same being charged in these German underground workings. Fig. 4 shows the details of construction of this German air locomotive. It has a main receiver *a*, and an auxiliary receiver *b*, both being mounted upon a cast iron frame giving the total adhesion weight of 5½ tons for the engine. The main receiver *a*, has a pressure of 50 atmospheres and a reducing valve communicates with the auxiliary receiver *b*, maintaining a pressure of the latter constant at about 10 atmospheres. A high and low pressure gauge is provided, and a safety valve with a whistle which blows off when the maximum pressure is reached. Compressed air is admitted from the auxiliary tank *b*, to the working cylinders *c*.

This mine air locomotive can take curves of 11 yards radius, and is capable of hauling 40 to 50 loaded cars weighing upwards of 2,000 pounds, at a speed of 5 miles per hour along a gradient of 1:300.

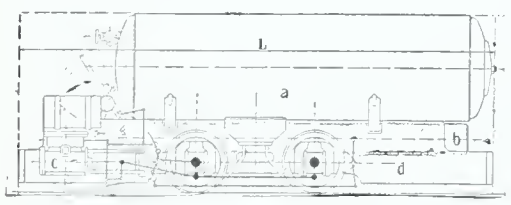


FIG. 4.—DETAILS OF CONSTRUCTION OF AIR LOCOMOTIVES.

The normal power required is from 8 to 12 horsepower, but a maximum of 24 horsepower may be developed when necessary. The receivers have a capacity of 1.65 cubic meters, and at a pressure of 50 atmospheres are capable of supplying 82.5 cubic meters. It is stated that as wide a range as possible was provided between the pressure existing in the main engine tank and the maximum pressure generated by the compressors, as this affects the rapidity of charging the engine receivers. From 1½ to 2 minutes only are required to connect and disconnect the flexible charging tube and to charge the receiver, while the primary pressure of 100 atmospheres allows the use of small primary reservoirs and compensates for the effects of oscillations in the load.

It is maintained that even under variable conditions of haulage during the working shift, the compressor plant remains very evenly loaded. This is of great advantage when a steam engine is used for driving, as the speed of rotation may be made to conform to the mean rate of duty required during the shift. This is difficult with an electric motor, which must be designed for a wide range of speed.

In the compressor plant in the main engine room above ground, electric power is generated for operating various other mining machinery. A primary pressure of 100 atmospheres is obtained in two stages, the compressor operating at 200 revolutions per minute and compressing 4.5 cubic meters of air per minute to the above pressure. The compressor is driven by belt transmission, a continuous current motor being used of 85 horsepower capacity. All lubricating oil is eliminated by first passing the air through a stand pipe, from which it goes into an iron receiver connected with the pressure piping leading into the mine. This piping has flange connections of special construction, the wrought iron pipes utilized being 1½ inches in inside diameter, with rubber packing at the joints for making the same perfectly air tight.

There are three additional air receivers in the pipe system, each being fitted with a charging valve and flexible metallic tubing which is connected to the locomotive receiver as indicated in Fig. 2.

The engineers installing this German mine haulage system placed the cost of the plant, including installation and freight, at about $16,000, with the cost of steam piping and tanks at about $2,000 more. Estimating the interest and depreciation at 10 per cent, and including the cost of labor, repairs and consumption of oil the total cost is given as .0695 Mark per ton-kilometer. With current at ·025 Marks or about ½ a cent per kilowatt hour, the total cost of working would be about 2 cents per ton-kilometer or 4 cents per ton mile.

It is held that after working many months without a single break down, this system has shown itself to be thoroughly reliable. It is maintained that the compressed air mining locomotive exceeds the dimensions of the electric mine locomotive only in the matter of length, and this by a couple of feet, while the track construction need be no heavier than for electric traction.

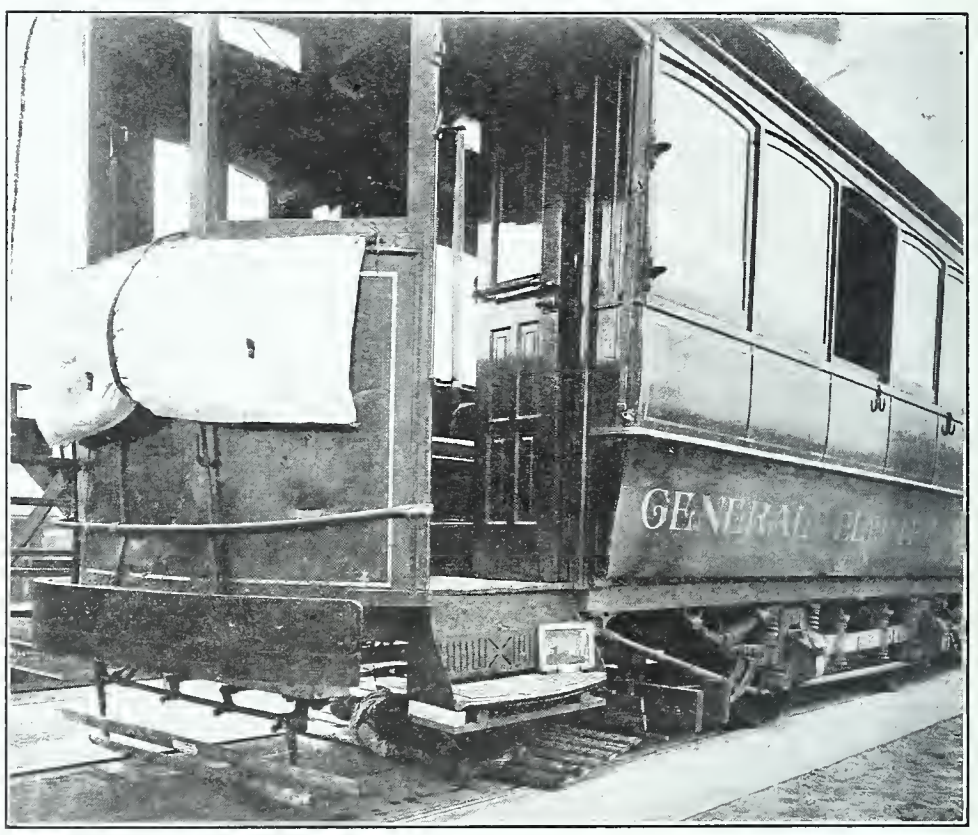
This air mine haulage system is creating considerable interest abroad and without doubt will be installed in many mines in the near future.

Transporting Live Fishes.

Live fishes are being transported for the markets in Germany, as the latest novelty in the food supply industries. Shipments are made for considerable distances, some from Lyons, France, and some from Roumania. As many as four tons of fish have been carried alive in one and one-half tons of water. This seems like packing them as closely as sardines, but under the system used, oxygen is forced through the tank by means of a circulating pump and the carbonic acid exhaled is absorbed by lime plates. Only salt water fish have so far been transported, but it is proposed to apply the same system to the carrying of fresh water fish. This plan is partly the result of the German law which permits fresh water fish to be offered for sale only when alive, to prevent the danger of ptomaine poisoning. It is believed that it would be quite possible to carry live fish from New York to the Mississippi Valley, or from the Great Lakes to the Rockies by this method; and the German company is said to be looking for American connections.

UNIVERSAL LIFE-GUARD.

THE accompanying illustration shows the operation of a novel English life-guard designed to meet the requirements of electric railways. A demand having arisen for an automatic and instantaneous appliance to safely pick up any person or object knocked down, or falling on the roadway, the life-guard shown in the photograph has been accepted by the English Board of Trade and is in use by all the important street railways in Great Britain. It is also said to be employed in France, Belgium, Italy, Spain, and Greece, which indicates that it is suitable for track conditions in these climates.



As may be seen in the cut, the guard is of simple construction, consisting of a tray (normally held in a raised position) which is secured immediately in advance of the front wheels, and a depending gate attached to the forward portion of the platform. The gate and tray are usually composed of strips of some tough wood, mounted on iron braces, altbough iron may be substituted for the wood when it is found cheaper to do so. A trigger and spring connection beneath the platform unites the gate with the tray, the function of which is to depress the tray when the gate strikes any object lying upon the track. Quickness of operation is the essential point in appliances of this nature. So rapid is the movement in this case that it is claimed to be impossible for any person to be dragged under the wheels of the car, even though the speed at the moment of the accident may be at the maximum. The trigger is so simple that there is only one movement between the gate and the tray, and not a moment is lost in bringing the latter down firmly upon the ground, ready to catch the object with which the gate has come in contact. The spring then holds the tray in position until the person (represented by a dummy in the illustration) is safely removed.

It is a regrettable fact that most of the fenders in use on street cars are entirely inefficient. As a railway official in a Western city recently explained, in an unwonted burst of frankness, "They are put there to satisfy the public, and make them feel that we are trying to protect them." Experiments with the types of fenders most commonly in use in this country have shown shocking results. Instead of being lifted or thrown to one side, in accordance with the theory on which these guards are supposed to work, the dummy was in most cases dragged and mangled. It was proved that many of the so-called guards are really death traps, and only in exceptional cases—by accident, as it were—did the dummies escape. There is agitation in street railway circles in favor of the adoption of some appliance that is not such a menace to the public, and it may be that this device which has received the sanction of the British Board of Trade, will be found available on this side of the water.

Meat Cured by Electricty.

Meat can be electrically cured in much less time than was consumed by following the old method, as is attested by three years' trial in some curing houses. In a large wooden tank filled with the ordinary pickle the meat is placed, and an alternating current is passed through the vat. The electrodes are of carbon, and are surrounded by porous cups that dip into the brine. It is said that the action of the electricity is not exactly known but it seems to send the pickle into the meat and thus make the curing go forward with great rapidity. The pickle is also preserved and prevented from deteriorating. The cost of the process is about $1 for curing 4,000 pounds of meat.

ARMORED AUTOMOBILES.

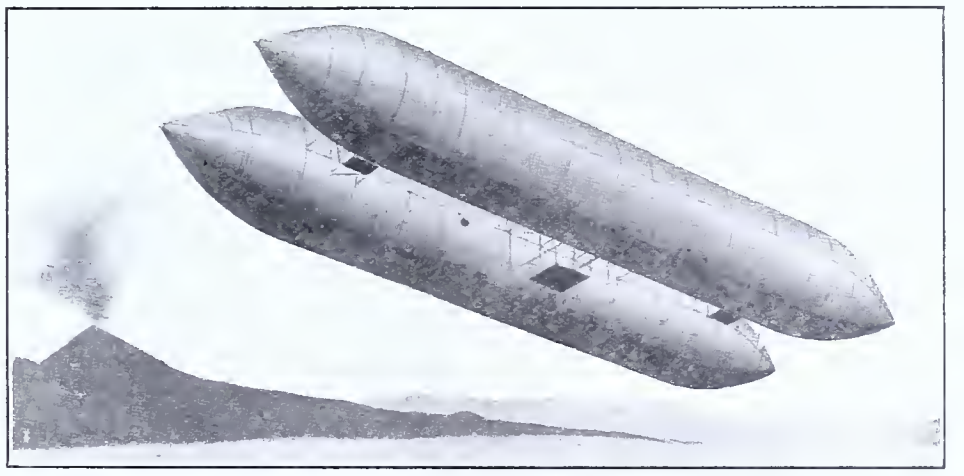
The automobile will figure as prominently in the next war as it now does in the transport of passengers and peaceful articles of trade. Among the martial preparations in which the great countries of the world are constantly trying to outstrip each other, there appear not only submarines, Dreadnaughts, and balloons, but armored automobiles as well. These vehicles will serve to rapidly convey troops from point to point across countries where no railroads have been laid or where the latter have been destroyed, and they can also be used as weapons of direct attack, by carrying Hotchkiss guns. The accompanying illustration shows an automobile covered with heavy steel plates, hard enough to withstand shots even from shrapnel. The sheathing, as will be noted, covers the entire car when desired, although the windows may be opened if occasion requires it. It is claimed that the plates cannot be penetrated by balls at 55 yards.

The wheels are provided with pneumatic tires, the air chambers of which contain a special solution which has a tendency to retard the flattening of the tires in case of puncture. Rails are secured along the sides of the car, which can be detached and made into small steel bridges, enabling the car to cross ditches and streams of certain depths and widths. The chimney-like projection on the top of the vehicle consists of a cylindrical reservoir adapted to hold 30 gallons of gasolene or petroleum — the latter being used more universally for motive power abroad than it is in this country. The car has from 25 to 30 horse power, and attains a speed of 25 miles an hour on the level and, it is claimed, 15 or 18 over rough country. It can go 350 or 400 miles without renewing its fuel.

The chauffeur is completely protected, in front, by the steel plating; two tiny perforations at the level of the eye enabling him to follow the road. The revolving turret at the back of the machine covers a Hotchkiss gun, which at a range of 22,000 feet, can shoot 500 balls per minute, and can be pointed in all directions. The car is also capable of carrying five men and 100 pounds of ammunition, and weighs when fully loaded and in marching order, 7000 pounds. The cost of one of these fighting machines is about $16,000. Germany and France are manufacturing them, and Russia has ordered several dozen. They are easily manoeuvered, and on a field where the ground permits rapid movements of wheels, they could no doubt do much toward disconcerting the infantry of the enemy. It is likely, at least, that they will practically supersede horses.

A NEW AIRSHIP.

The great defect in modern dirrigible balloons is their want of a gas-tight envelope, and of a suitable system for controlling the vertical motion. The loss of gas means the gradual loss of lifting power, and restricts the travelling capacity of the vessel. On the other hand, without some system which will enable the aeronaut to ascend and descend safely and at will, a machine cannot be truly called a dirigible at all. A new device by an Italian, Dr. Schiavone, promises to avoid these drawbacks. It consists of two dirrigibles (as shown in the cut) equal in shape and size and rigidly coupled together, with platforms for persons and machinery, and with appliances for controlling the motion. Each balloon is formed of a middle cylindrical body tapering at its ends so as to penetrate the air with the least resistance. The shells are entirely metallic, being composed of thin sheets of aluminum, formed in a series of annular sections, convexed externally in cross sections and having inturned flanges by which the adjoining annular sections may be rigidly secured together, thus practically constituting a corrugated structure which is effectually reinforced and strengthened against internal and external pressure. The tapered ends are made partly by a gradual decrease of the diameters of the sections, and partly by a smooth conical removable section which can be secured to the other part by a special hermetical system.



THE SCHIAVONE'S AIR SHIP.

Each balloon is reinforced by a skeleton frame which is composed of tubings preferably made of aluminum. The interior space is divided into three compartments, the central of which is the largest, while the other two are situated at the tapered extremities, the division being effected by means of diaphragms made of flexible and impervious material. The middle compartment is designed to receive a lifting gas, while the end chambers will hold compressed air. Ingenious devices are provided to regulate the introduction of the air into the end chambers in large or small quantities, according to the needs of navigation. The buoyancy of the apparatus can be regulated by diminishing the amount of compressed air and permitting the internal expansion of the gas, or by increasing said quantity and lessening the power of ascension. The use of the compressed air, which can be drawn at any time from the surrounding atmosphere, does away with the cumbersome and ineffective method of employing ballast.

The compressed air is obtained by a compressor connected conveniently to the end compartments. The employment of air also serves that most important problem in aeronautics—stability. It serves to maintain equilibrium of both balloons, and keep them in the same horizontal plane either in ascent or descent. To turn the apparatus laterally, compressed air is injected into the end compartments on the side toward which it is desired to turn, or is expelled from the end compartments of the other balloon while to move vertically, the air is modified uniformly and simultaneously in all the end chambers.

The two balloons are permanently coupled together by a framework of aluminum. On the forward and backward side a couple of bars support the propeller shaft, upon which one or more screws are mounted, and propelled by a motor, either electric or of any desired type. The shafts are so mounted that their longitudinal axis coincides with the axis of resistance of the whole dirigible. Midway of the twin-balloons is arranged a central platform, designed to hold persons, engines, instruments for observations generating power apparatus, and an accumulator reservoir for supplying air under pressure to the end compartments.

How to Get Copies of Patents.

THE INVENTIVE AGE prints each month a list of the patents granted by the Patent Office. This list includes the name of the inventor, the title of the invention and the date of the patent. Anyone can procure through THE INVENTIVE AGE a copy of any patent included in the list, by giving the data and enclosing ten cents in stamps for each copy. There is no better way of keeping yourself informed about the progress of the arts, than by scanning the list each month and ordering copies of patents.

PATENTS, DESIGNS AND TRADE-MARKS IN GREAT BRITAIN.

Such radical changes have been effected by recent legislation in the patent practice of England, that existing works on this subject have been rendered to a great extent obsolete. A book just issued by the D. Van Nostrand Co., of New York, "The Law and Commercial Usage of Patents, Designs and Trademarks," by Kenneth R. Swan, B. A., has for its object not only to present the existing British law accurately and as fully as is practicable in a volume of convenient size, but also to offer it in such a form as to be readily comprehensible to the layman unfamiliar with legal phraseology, and of value to those engaged in the trades and industries concerned with the patenting of inventions and the registering of designs and trademarks. In dealing with patents, the author has endeavored to handle the subject from a commercial as well as a legal point of view paying regard to the interest of the inventor and proprietor on the one hand, and of the general public on the other.

Although patents, designs and trademarks cannot be said to be very intimately related to one another from a purely legal point of view, they nevertheless possess affinities of a practical kind, amply justifying their traditional association. Lodged together under the roof of the Patent Office and jointly supervised, they are not unnaturally linked in the public mind as the three principal forms of monopoly, the aim and object of which is eminently commercial. In an interesting review of the history of patent law, the writer points out that the grant of letters-patent for inventions is the survival of one of the most dearly cherished of the ancient prerogatives of the Crown—that in virtue of which the sovereign claimed the power to regulate the trade of the country and to grant special commercial privileges to particular persons. But like most royal prerogatives, its glory has long since departed. "Patents," in those days, were trade monopolies, and were so oppressive that finally the abuse was checked by a special statute. Patents on inventions were few in number: up to the middle of the eighteenth century hardly a dozen were granted yearly, and as late as the middle of the nineteenth century the issue did not exceed 500 per annum. This was mainly due to the extreme cost and the intricacy of procedure, the former amounting to $2,500, which made a patent a luxury beyond the reach of the average inventor.

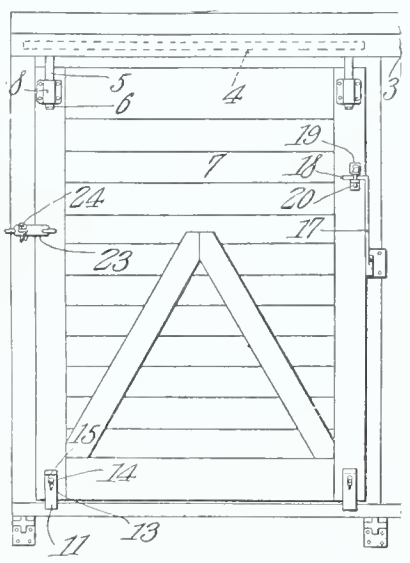
The nature of a patent, the meaning of infringements, amendments, limitations on patent rights, etc., are discussed at length, as well as the new British legislation, which has already been treated in these columns. Greatly increased jurisdiction is given to the Comptroller General of Patents (who corresponds to our Commissioner) by this new law. He is empowered not only to refuse applications for patent on his own initiative on the ground of anticipation, but can revoke the patents already granted, a right hitherto wielded by the courts. Further, the grounds upon which a patent may be revoked have been extended. It is now a ground of invalidation that the patent is worked mainly outside England—a provision practically identical with the compulsory working clauses of most foreign patent codes. An innovation designed to benefit the inventor is the institution of patents of addition, enabling him to obtain a cheap form of protection for minor improvements upon an invention already patented by him. The whole book is a valuable survey of the development of the British patent system.

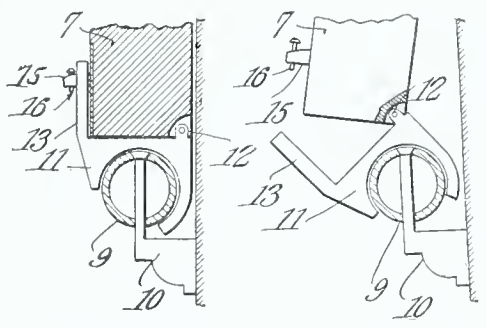
CLEVER NEW PATENTS.

Car Door.—Illuminated Sign.—Bottle and Lid.

Car Door.

Railway men who handle freight in cold climates are often much troubled by the difficulty in opening the doors of the cars, on account of the accumulation of ice or impacted snow on the outside. A door specially designed for use on cars for transporting live stock as well as other freight, has been patented by Peter J. A. Schnoor, of Holstein, Iowa, and assigned to the Great Western Novelty Company, of Omaha, Nebr. It is designed to be opened regardless of any outward bulge of the side of the car, and—another important advantage—it cannot swing outwardly at its lower edge and perhaps strike a passing train when the car is in motion. These objects are effected through the construction





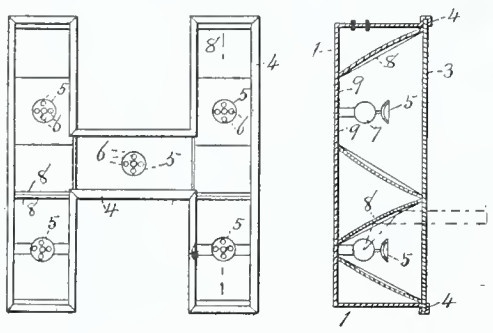
illustrated herewith, the drawings showing a side elevation of the door, closed, and also transverse sectional views enlarged, giving the positions of the parts when the door is opened or closed.

A guide is located at the upper side of the car, consisting of two plates attached together at the top and open at the bottom, which enclose a runner with two shanks which extend down betwen the plates and slide into clips on the door, in such a way that the door is allowed a certain movement along the runner. At the base of the door is a cylindrical track 9, supported on brackets 10, and adapted to be received in interrupted rings 11, pivoted at their upper edges to the door, as at 12. The rings are so arranged that the portions of the brackets 10 which join the track 9 may pass through the interruptions, as the door moves along the track. Each ring has an upstanding lug 13, which is perforated, and pins 15 project from the outer face of the door and enter these perforations, being secured therein by pins 16. A securing lever 17 is fulcrumed to one edge of the door, and has a handle adapted to enter a shackle 19 on the outer face; and when in this position the curved tongue of the lever engages a keeper on the car, thus pulling the lower part of the door close shut, in which position it may be retained by a hasp and staple. When it is desired to open the door, the free end of the lever is swung down, thus disengaging the tongue from the keeper and permitting the lower part of the door to swing somewhat. This movement is limited by the rings which turn on the track as an axis. Should the side of the car bulge, the door is swung far enough away to permit it to escape the bulge as it moves along the track. This outward swing will also fracture possible accumulations of ice, and render the door free for longitudinal movement. It is by reason of the fact that the clips slidably receive the shanks that the lower part of the door may have this outward swing, while the upper portion is secured so as to prevent the door accidentally swinging open.

Illuminated Sign.

The commercial public is realizing the value of illuminated signs as a form of advertising. There are few better ways of attracting attention than to write a name in letters of fire across the night, and as a result of the extended use of these signs, many of our city streets are becoming great white ways. Something new in this line is offered by a patent recently taken out by Roy R. and Wallace K. Wiley, and Wm. S. Hough, of St. Catherines, Ont., Canada. It provides a brilliant sign for long distance as well as for short vision, in which the maximum brightness is attained with the use of very few lamps, and consists essentially of a number of segments of parabolic or curved reflectors so placed in regard to each other as to form a letter or character, the whole being surrounded by a box.

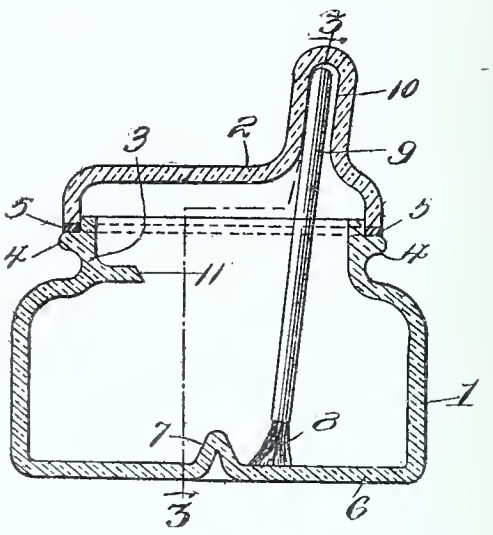
In the drawings, which show a front view and a vertical section of the device, which in this case is arranged to form the letter H, 8 indicates the central segmental reflectors located within a box of the same shape, which latter is covered by a glass plate.



The reflecting portion of the reflector is that portion of a paraboloid which lies between two parallel planes, on opposite sides of its axis. Lamps 7 are located at the foci of the reflectors. Small auxiliary reflectors 5 may also be used in front of the lamps, to throw the light back to the main curved reflector, which prevents a dotted or spotted appearance and serves to increase the legibility at a distance. In operation, the light is divided, one portion being reflected by each reflector, in a beam of light having approximately a rectangular cross section, another portion being thrown forward by the flat surface 9 at the back of the lamp, and another portion striking the reflector 5, then the reflectors 8 and 8, and finally leaving the device, while some of the light radiated to the reflector 5 passes through the perforations shown at 6, and evens up the general brilliancy of the character.

Bottle and Lid.

Any one who has ever gotten his fingers gummed with a sticky mucilage brush will appreciate a recent invention of Frank C. Borgmeyer, of St. Charles, Mo., of a bottle so arranged that the handle of the brush will be kept free from the paste or other contents thereof. The lid is adapted to keep the liquid air tight, and when it is removed the handle will fall into a certain position, and will never sink into the mucilage itself. Means are also provided for removing surplus paste from the brush, so that the adhesive material can be applied evenly and lightly to any object, and the brush is not wiped on the top of the bottle, which again causes the top to stick and involves inconvenience. As shown in the accompanying cut, which gives a vertical longitudinal section through the bottle, the neck is smaller than the body, but is of the same general oblong shape. The top covers the handle of the brush, and is fitted to the bottle by a shoulder and gasket, in such a way as to be air tight. At about the center of the bottle is a tranverse inward offset 7, which keeps the brush from slipping down. The handle is received in an inclined annular extension 10 of the lid, which serves to cause the handle, when the lid is removed, to fall against that side of the neck toward which it inclines when the lid is in place. At the opposite side of the neck the bottle has an offset 11, which acts as a scraper to remove surplus mucilage, leaving the amount on the brush that is necessary. When the bottle is opened, the handle, it will be seen, falls away from the scraper, thereby preventing the paste from getting on the handle.



LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

NEIDER et al. v. HIGGIN MFG. CO.

(Circuit Court of Appeals, Sixth Circuit. Dec. 18, 1908. 167 F. R. p. 128.)

PATENTS—ANTICIPATION-TUFTING BUTTONS FOR CUSHIONS.

The Neider patent, No. 630,553, and the Marggraff patent, No. 695,468, both for improvements in tufting buttons for cushion seats, consisting of strengthening the base of the prongs which are passed through the material and clinched, so that the bending point, when clinched, will be at some distance from the head of the button where the metal has not previously been weakened by bending, conceding that the improvements involve invention, are void for anticipation by the Jensen patent No. 377,029 for a paper fastener.

SACKETT PLASTER BOARD CO. v. RUTKOWSKY.

(Circuit Court, D. New Jersey. Feb. 3, 1909. 167 F. R. p. 138.)

PATENTS—VALIDITY AND INFRINGEMENT—PLASTER BOARD.

The Sackett patent, No. 520,123, for a board or plate for use as a substitute for lath and plaster as an inside wall covering, consisting of alternate layers of paper and a mineral plaster in the nature of a lime cement, was not anticipated, and discloses invention; also held infringed.

COFFIELD et al v. FLETCHER MFG. CO.

(Circuit Court of Appeals, Sixth Circuit. Feb. 18, 1909. 167 F. R. p. 321.)

PATENTS — SUIT FOR INFRINGEMENT — EFFECT OF APPLICATION FOR REISSUE.

Where a patentee, pending a suit for infringement applies for a reissue under Rev. St. § 4916 (U. S. Comp. St. 1901, p. 3393), on the ground that the specification of his patent is insufficient and such reissue is granted, he is estopped to claim that the specification was sufficient, or to further maintain the suit for the infringement of the patent.

HOLEPROOF HOSIERY CO. v. WALLACH BROS.

(Circuit Court, S. D. New York. Nov. 11, 1908. 167 F. R. p. 373.)

1. TRADE-MARKS AND TRADE-NAMES—INFRINGEMENT—NAMES SIMILAR IN MEANING.

The word "Holeproof," used as a trademark for hosiery, conceding its validity, is not infringed by the use by another manufacturer for a similar article of the name "Knotair."

2. TRADE-MARKS AND TRADE NAMES—UNFAIR COMPETITION-IMITATION OF PACKAGES.

The use by defendant, in packing hosiery for the retail trade, of boxes and labels similar in color and appearance, and in the kind of type and color of printing thereon, to those previously in use by complainant for its own product, together with a similar mode of dressing the packages, and the fact that defendant's salesmen in some instances palmed off its goods on customers as those of complainant, held to constitute unfair competition, which entitled complainant to a preliminary injunction.

E. J. MANVILLE MACH. CO. v. EXCELSIOR NEEDLE CO.

(Circuit Court of Appeals, Second Circuit. Jan. 12, 1909. 167 F. R. p. 538.)

1. PATENTS—PATENTABILITY-COMBINATION.

The fact that a completed product is developed by successive steps in the same machine does not prevent the organized mechanism which produces this result from being considered as a combination.

2. PATENTS—CONSTRUCTION—PARTS OPERATING "SIMULTANEOUSLY."

The word "simultaneously," used in a patent to describe the operation of the parts of a machine which in fact operate progressively to complete the article produced, must be construed to mean that the parts operate unitedly, harmoniously, and in concord, and not at the same instant of time.

3. PATENTS—INVENTION AND INFRINGEMENT—MACHINE FOR MAKING NIPPLES.

The Campbell patent, No. 594,457, for a machine for forming threaded nipples, such as are used in building wire spoke wheels for bicycles and similar vehicles, was not anticipated and discloses invention; also held infringed.

GENERAL SUB-CONST. CO. v. NETCHER et al.

(Circuit Court, N. D. Illinois, E. D. Feb. 11, 1909. 167 F. R. p. 549.)

1. PATENTS — CONSTRUCTION — READING SPECIFICATION INTO CLAIMS.

For the purpose of sustaining a patent, as where a nonpatentable principle or function appears to be claimed, but the specification shows that the patent was sought for a machine, device, or process which is patentable, the specification may be read into the claims, but not for the purpose of escaping anticipation or establishing infringement.

2. PATENTS — CONSTRUCTION — READING SPECIFICATION INTO CLAIMS.

A feature of a process not covered by the claims of a patent, but merely recommended in the specification, instead of being required or stated to be an essential part of the process, cannot be read into the claims.

3. PATENTS — ANTICIPATION — PROCESS OF MAKING SUBSTRUCTURES FOR BUILDINGS.

The Ewen patent No. 718,441, for a process for making substructures for buildings, as such process is described in the claims, is void for anticipation, the real process as practiced by means of the appliances described in the patent not being covered by the claims.

FERNALD v. ONEIDA NAT. CHUCK CO.

(Circuit Court, N. D. New York. Feb. 22, 1909. 167 F. R. p. 559.)

1. PATENTS—PATENTABILITY—EVIDENCE OF INVENTION.

While the commercial success of a patented device may be important in the question of invention and may determine such question in a close case, it is not alone sufficient evidence of mental conception, amounting to invention, to sustain a patent.

2. PATENTS—PATENTABILITY—INVENTION—THILL-COUPLING.

The Fernald patent No. 747,874, for an improvement in thill-couplings, construed, and held void for lack of invention in view of the prior art.

WHITEHEAD & HOAG CO. v. BASTIAN BROS.

Circuit Court, W. D. New York. Oct. 1, 1908. 167 F. R. p. 565.)

1. PATENTS — INFRINGEMENT—BILL HOOK.

The Studebaker patent, No. 615,921, for a bill hook combined with an advertising card, discloses novelty and patentable invention, but is of narrow scope, and is restricted by the prior art to the peculiar arrangement by which the eye in the hook enables the latter to lie flat against the supporting plate or to be held in a position at right angles to it. As so construed, held not infringed.

2. PATENTS—INFRINGEMENT—BILL HOOKS.

The Hornich patent, No. 789,218, for a bill hook, the principal feature of which is the method employed for locking the hook in its position on the supporting plate, discloses patentable novelty in such feature, and is entitled to a moderate range of equivalents. Also, held infringed.

EDISON ELECTRIC LIGHT CO. v. NOVELTY INCANDESCENT LAMP CO.

(Circuit Court of Appeals, Third Circuit, Feb. 16, 1909. 167 F. R. p. 977.)

1 PATENTS — INVENTION — INCANDESCENT LAMPS.

The Edison reissue patent No. 12,393 (original No. 444,530), for a leading-in wire for incandescent lamps, in which the joint between the exterior copper wire and the interior platinum wire is sealed within the glass, which both effects a large saving of platinum and greatly strengthens the joint, was not anticipated, and discloses invention. Also, held infringed.

2. PATENTS — INVENTION— CORRECTION OF MISTAKEN IDEA — USE AND ARRANGEMENT OF MATERIALS.

While the correction of a mistaken idea entertained by the art, amounting to the mere recognition of a mechanical truth, may not be an inventive act, invention may be found in a new structure, involving a readjustment of materials in use, by which new and highly beneficial results are brought about. Daylight Manufacturing Company v. American Prismatic Light Company, 142 Fed. 454, 73 C. C. A. 570, distinguished. Rainer v. Western Tube Company, 159 Fed 431, 86 C. C. A. 411, followed.

3. PATENTS—INVENTION--REARRANGEMENT OF MATERIALS—REVERSAL OF STRUCTURE.

Where, therefore, in incandescent electric lamps, already in use, an inner copper or bronze section of the leading-in wire, supporting the filament, was extended down into and sealed up in the glass neck, where the union with the intermediate platinum section was made, the union of the latter with the exterior copper section being outside the glass, in view of the difficulties of the problem as shown by the efforts of other inventors and the resulting advantages thereby secured, it involved invention to reverse this structure and extend the outer copper section into the glass, making a union with the platinum there.

4. PATENTS — ANTICIPATION —ACCIDENTAL REALIZATION OF STRUCTURE.

A merely accidental occurence, realizing the structure of a patent, not only not appreciated, but actually made the ground of rejection as an imperfection, does not amount to an anticipation.

5. PATENTS — ANTICIPATION — MISTAKEN FIGURE IN PRECEDING PATENT.

Neither is it an anticipation that by a mistaken showing in the figure of a preceding patent, by the error of the draftsman, the structure of the patent appears contrary to the conception of the inventors and the reading of the patent.

GENERAL ELECTRIC CO. v. MORGAN-GARDNER ELECTRIC CO.

(Circuit Court of Appeals, Seventh Circuit. Oct. 6, 1908. Rehearing Denied November 24, 1908. 168 F. R. p. 52.)

1. JUDGEMENT — CONOLUSIVENESSS OF ADJUDICATION PERSONS PARTICIPATING IN DEFENSE.

The fact that a manufacturing company paid the attorney who defended a suit against a customer for infringement of a patent, and part or all of the costs, did not make it a party, so as to be concluded by the decree, where it did not appear that the attorney was not under the exclusive direction and control of the defendant.

2. PATENTS — APPLICATIONS AND PROCEEDINGS THEREON—AMENDMENT OF APPLICATION.

An applicant for a patent may properly file new claims in the Patent Office without verification, where they are within the invention as disclosed in the specification and drawings, and narrower than the original claims.

3. PATENTS — VALIDITY AND INFRINGEMENT — ELECTRICAL CONTROLLERS.

The Knight and Potter patents, Nos. 587,441 and 587,442, for a means and method of regulating the power and speed of mechanism driven by two electric motors, held valid and infringed.

COLUMBIA CHEMICAL CO. v. DUFF.

(Circuit Court of Appeals, Third Circuit, Feb. 19, 1909. 168 F. R. p. 57.)

PATENTS—LICENSES — ROYALTIES—RIGHTS AND LIABILITIES OF PARTIES.

Plaintiff contracted to furnish defendant with plans and specifications for building four patented gas producers, with a warranty that in addition to the gas they should produce as a by-product 70 pounds of sulphate of ammonia per ton of coal consumed, provided such coal contained not less than 1.3 per cent of nitrogen. Defendant agreed to build the machines and to pay a license fee for their use if they fullfilled the warranty. Having refused to make such payment, plaintiff sued therefor, alleging fulfillment of the warranty, which defendant denied, and that issue was the only one tried. Held, that it was error for the court to instruct the jury that if defendant used coal containing less than the required per cent of nitrogen it waived the warranty of 70 pounds of sulphate of ammonia per ton, and plaintiff could recover if a proportionate amount was produced, since the requirement as to the percentage of nitrogen was one for plaintiff's benefit, which he alone could waive or could insist on, and that if he consented to the use of inferior coal, as he admittedly did, the waiver was his and not defendant's, and did not relieve him from the warranty.

LICHTENSTEIN v. PHIPPS.

(Circuit Court of Appeals, Second Circuit, Feb. 16, 1909. 168 F. R. p. 61.)

PATENTS—MARKING PATENTED ARTICLES.

Notice of a design patent for a hatband on women's sailor hats is not sufficiently given under Rev. St. § 4900 (U. S. Comp. St. 1901, p. 3388), by printing the words "Lichtenstein Pennant Sailor, Pat. Jan. 15th, 1907," upon the lining in the inside of the hats, there being nothing to indicate that such notice refers to the band.

HALL SIGNAL CO. et al. v. GENERAL RY. SIGNAL CO.

(Circuit Court W. D. New York, Nov. 4, 1908. 168 F. R. p. 62.)

1. PATENTS—INVENTION—SUCCESS OF DEVICE.

A simple device or improvement may involve patentable invention, where it converts failure into success or accomplishes what others had tried to accomplish and failed.

2. PATENTS — INVENTION AND INFRINGEMENT—BLOCK SIGNALING APPARATUS.

The Wilson patent No. 470,813, for an electric railway signal apparatus, was not anticipated, and covers a combination which was the last step in making the normal danger system of signaling successful and practicable, and is entitled to rank as a pioneer in the art and to a broad construction. As so construed, also held infringed.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Frank E Moinett, Alliance, Ohio. Metallic Leaves for Account Registers.—In account registers, a series of pivoted sheet metal leaves are employed on which the slips or memoranda are clipped or otherwise attached. The object of the present invention is to improve the construction of the sheet metal leaf or page by providing means for reinforcing the bottom edge of the leaf and pivotally attaching the leaf to a base or to the next succeeding leaf. The invention consists in forming the bottom edge of the leaf with a roll or bead reinforced by an inwardly-turned flange or marginal portion, and using in connection therewith end plugs which close the ends of the bead or roll and have hinged pintles attached thereto.

Edward A. Gehrke, Lincoln, Neb. Tap Screw for Plugging Leaks.—The principal object of this invention is to provide a tap screw equipped with an annular gasket-receiving recess, forming an outer flange or wall at the periphery of the gasket to hold the same in place and prevent the gasket from breaking and crowding from under the head of the screw when pressure is applied, said wall terminating short of the engaging face of the gasket to cause the latter to project beyond the lower edge of the wall or flange in order to make a watertight joint. The tap screw is provided at the top of the stem with a smooth portion to receive the gasket and prevent the threads from cutting and breaking the inner edge of the gasket and rendering the same more easily broken and destroyed

Lawrence Massa, Oakdale, Cal. Coupling for Rotary Drills.—An object of this device is to provide a drill coupling, adapted to be readily applied to drill tubes, enabling the same to be quickly uncoupled, thereby saving time and labor when removing the drill tubes from a well for changing the bit or for other purposes. The invention provides a drill tube coupling composed of beveled overlapped slidably interlocked members and equipped with elastic tubular gaskets, tapered to conform to the beveling of the members, and provided with elliptical metallic face plates to prevent wear of their engaging faces.

Wm. W. Reid, Winnsboro, Tex., inventor; J. F. Hitt, Winnsboro, Tex., assignee. Sweep Holder for Plows.—An object of the present invention is to provide a device, designed for securing a rear sweep to a plow foot or standard, and capable of adjustment to accommodate different kinds and sizes of rear sweeps, and adapted to effectually prevent the same from turning on the heel bolt and loosening the tail nut. Another object of the invention is to provide a sweep holder, adapted to keep a heel sweep straight and capable of bracing and thereby strengthening the same at its point of attachment to a plow foot or standard, where the sweep is the weakest.

George E. Gibson, Fort Dodge, Iowa. Chicken Feeder.—The object of the present invention is to provide a device adapted to lessen the labor of feeding chickens and other fowls, and capable of being readily operated by the chickens and of scattering among straw and other rubbish a quantity of feed each time it is operated, thereby affording the exercise necessary to a maximum production of eggs.

Albert O. Heimsness, Fillmore, N. D. Whiffletree.—An object of the invention is to arrange the singletrees of carriages or other vehicles in the plane of the pole to afford a straight draft or pull, and to prevent the singletrees and the doubletrees from twisting on their pivot bolts under the strain incident to a heavy load. Another object of the invention is to provide a doubletree, adapted to dispense with the stay straps usually employed for limiting the swing of the doubletrees.

John S. Kerfoot, Oklahoma City, Okla. Safety Net for Elevator Shafts.—This invention has for its object to provide a safety net, adapted to be placed in an elevator shaft at the bottom thereof without interfering with the operation of the elevator, and capable of cushioning the fall of a person down the elevator shaft to prevent serious injury resulting from an accident of that character.

James B. Morrison, Minneapolis, Minn. Sad Iron.—It is the aim of the present invention to provide a sad iron equipped with a burner, adapted to be readily secured to and removed from the hollow body of a self-heating sad iron, and capable of affording a blue flame and of reducing the consumption of gas and of preventing the burner tubes from clogging.

John D. McIntosh, Alexandria, Ontario, Canada. — Ball Bearing Vehicle Axle.—An object of this invention is to eliminate the friction resulting from the end thrust of the axle box and the spindle, and to provide a rotary ball bearing washer for each end of the axle box, adapted to reduce the friction to a minimum and to exclude dust from the bearings.

Leslie D. Putney, Peoria, Illinois. Spring Trip for Cultivators.—An object of the present invention is to provide a spring trip for cultivators, adapted to permit a cultivator tooth or shovel to swing backward when it encounters an obstruction, and to return automatically to its operative position after the obstruction has been passed. Another object of the invention is to equip the spring trip with means, adapted to render the device easy or hard to trip, so as to secure the desired resistance to the tripping action of the device.

Chester W. Prouty, Minneapolis, Minn., inventor; Frederick S. Lewis and Jesse C. Heritage, Minneapolis, Minn., assignees. Ventilating Sash Lock.—An object of the present invention is to provide a sash lock, adapted to be readily applied to the sashes of a window, and capable of locking the sashes in their closed position and of permitting a limited relative movement of the sashes. Another object of the invention is to provide a burglar-proof sash fastener, which will be effectually prevented from being surreptitiously operated from the exterior of the window, when either of the sashes is partly open for ventilating purposes.

William Parker, Tecumseh, Neb. Elevator for Baling Presses'—An object of this invention is to provide an attachment for baling presses and analogous compresses, adapted to enable a bale of hay, cotton, or other material, as it leaves the press, to be readily handled and easily placed upon a pile. Another object of the invention is to enable the elevator attachment to be compactly arranged upon the rear portion of the baling press when the latter is being transferred from one place to another.

James C. Thomas, Corsicana, Tex., inventor; Frederick W. Barth, same place, assignee. Tire Tread Chain for Automobile Wheels.—An object of this invention is to provide a device, adapted to be readily applied to and removed from a pneumatic tire, and capable of being retained thereon by the inflation of the tire and of effectually preventing skidding, punctures and blow-outs. Another object of the invention is to render an automobile, or other vehicle, reliable and safe, and capable of affording greater speed and of protecting the sides of the tire from the wear caused by ruts in the road.

John M. Wilson, Seneca, Neb. Counter-Balancing Attachments for Pumps.—It is the aim of the present invention to provide a counterbalancing device having a chain or cable and a counter-balancing weight, and provided with means for enabling the chain or cable to be readily connected with a pump without interfering with the operating mechanism thereof. Another object of the invention is to enable the counter-balancing device to exert a perpendicular pull on the pump rod to prevent lateral strain and consequent binding and friction.

Jacob Ziegler, Coffeyville, Kansas. Hame Tug and Trace Buckle.—The object of this invention is to provide a hame tug and trace buckle, adapted to hold in place the trace and the back and belly bands in the usual manner, and capable of instant adjustment along the trace and the hame tug to arrange the harness to fit large and small horses.

Henry Axtell, Berkeley, California. Stem Winding Mechanism for Watches—This invention is an improvement on the prior patent of January 12, 1909, and embodies improved mechanism to prevent an overwinding of the watch spring and a consequent breakage or strain of the mechanism. In the former patent, the crown for the winding stem was provided with a recess in the top, in which was threaded a perforated cap-plate. This construction was objectionable as it permitted the egress of lubricant and the ingress of moisture and shortened the life of the crown. These objections are obviated by the present improvement. and means are provided which entirely relieve the mechanism of any liability to breakage or strain, irrespective of the amount of rotation which may be imparted to the crown.

Gerhart Nuessen, Andale, Kansas. Device for Bundling Bags.—In the building trade, whenever cement is used, the empty sacks are always returned to the manufacturer to be refilled. The operation of bundling the sacks is slow and tedious, and the dust arising therefrom is injurious to the operator. The object of the present invention is to provide a device which is adapted particularly for use in bundling empty cement and grain sacks, though it can be used with equal success for bundling fodder, kindling wood, etc. It permits the operator to bundle, in one operation, a large number of the sacks in such a compact form that the express charges in shipment will be considerably less than heretofore. The invention is the result of practical experience and fully meets the wants of the public.

Balfour Feagle, Longview, Texas. Jewelers' Tools.—This invention relates to that class of jewelers' tools which are especially adapted for use in bending the prongs of a ring mounting around the setting, and the object is to eliminate any tendency whatsoever of the jaws of the tool slipping and thereby damaging the setting. The invention comprises a tool having crossed pivoted handles, the lower handle terminating in a straight upper jaw and the upper handle terminating in a curved lower jaw, the end of the latter jaw extending beyond the end of the upper jaw and being provided with an upstanding stud, the curved portion of the lower jaw extending outwardly in a horizontal position and at right angles to the upper jaw.

Oliver R. Henson, Springfield, Ohio. Signal Lamp.—This invention relates to signal lanterns of that type wherein a transparent colored cylinder or screen is adapted to be raised when desired around the burner and within the usual white or translucent chimney, thus changing the color of the light emanating therefrom. One object of the invention is to provide means whereby the colored screen may be raised within the usual chimney and seated at its upper end, thus accurately centering the screen; and also to provide means whereby the screen may be positively held and locked in a lowered position or quickly unlocked and forced upward, the locking and raising means being located within the hollow base of the lantern in such a position that it may be fully protected and guarded from any accidental operation.

Joseph Tams, Trenton, New Jersey. Button.—This invention relates to detachable buttons, or what are sometimes known as "bachelors' buttons," and more particularly to that class in which novel means are provided that will permit of the same to be readily applied and securely retained on any fabric. It consists of a button head of any style having a coiled shank member with its free end terminating in a reversely-turned and pointed hook which is adapted to engage in the fabric and thereby prevent the button from becoming disengaged.

Thomas H. Huggins, Zolfo, Florida. Trap.—This invention relates to traps of the character having body portions or cages into which the animal passes and provided with means for preventing the return of the animal when once within. The trap is so constructed that by changing the entrance used, it may be converted into a fish trap, a bird trap, or a trap for small animals such as rats, raccoons, etc. Means are provided whereby the bait used while open to view cannot be destroyed, and is so supported as to excite the curiosity of animals and attract them into the trap.

John E. Lang, Evansville, Indiana. Stove Pipe Fastener.—This invention relates to a device for holding a stove pipe or flue cap in proper position with relation to the chimney, and relates more particularly to a stove pipe fastening of that type provided with a collar adapted to be clamped around the pipe at the point where the same enters the chimney, and which is provided with means cooperating with the collar for preventing the pipe from moving out of the fluehole of the chimney. It consists of an improved clamping collar to engage the stove pipe, in combination with a device adjustably connected with the collar and engaging the chimney and stove pipe for facilitating the proper positioning of the latter.

William K. Wilson and Joseph Wallbillich, New Orleans, Louisiana, inventors; New Orleans Copper Works, assignee, New Orleans, La. Turpentine Still.—In turpentine stills it is the usual custom to provide a kettle with a single opening in its top over which the cap of the conduit leading to the condensing worm is detachably mounted. The object of the present invention is to provide novel, simple and effective means whereby the cap or conduit can be permanently connected to a still kettle having an oblong upstanding neck, separate means being provided for giving access to the still through the neck, said means thus permitting the introduction of the material without dismembering the structure, and also giving better access to the surface of the contents of the kettle for the purpose of skimming the same. Means are also provided to prevent the cap or conduit from injury during the charging operation.

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FOR SALE—Patent No. 642,404. Cross Line Buckle. Will admit of attaching or detaching short check at will. Can be attached to long line any place without pulling the end through. Can be manufactured as cheaply as the ordinary kind. Very strong and durable. Will sell outright or place on royalty plan with reliable firm. Address, H. P. McGowan, Hurley, Okla. jun

FOR SALE—U. S. Patent No. 943,454, granted Dec 14, 1909; Canadian Patent No. 123,625, dated Feb. 1, 1910. Mothers Sewing Companion. The primary object of the invention is to provide a portable stand that will serve the purpose of a pin cushion, work basket and shelves for toilet articles. All in a compact form. The shelves may be rotated until the desired article is within reach of the operator without the latter changing her position. Address, S. Pecoy, Cresco, Iowa.

FOR SALE—U S. Letters-Patent No. 935,391. Haying and Manure Loading Machinery. Three years test. Might consider royalty. Canadian patent pending. Write for particulars, John B. Mohan, R. F. D. No. 1, Effington, South Dakota. my

FOR SALE—Patent No. 943,495, dated Dec. 14, 1909; bolster for log wagons; has adjustable chocking device; will accommodate loads of different sizes; an invention of real merit. Address, John T. Warren, Hemphill, Texas. my

FOR SALE—U. S. Patent No. 937,631, Plumb Level. A very valuable invention. Fortunes in it. Will sell outright or part cash and royalty. Address at once, J. E. McMahal, Boulogne, Nassau Co., Florida. my

FOR SALE—U. S. Patent No. 938,580, issued Nov. 2, 1909. Punch. Will punch from the lightest tin plate to No. 20 gage iron, with one hand. For particulars write, Ferdinand Harling, Shenandoah, Iowa. my

FOR SALE—Patent No. 910,785, issued Jan. 26, 1909. The ultimate universal detachable sanitary soap dish. Fits all basins. Holds soap firmly when throwing water out. A boon to all homes, camping and outing parties. Can be manufactured at small cost. Apply to T. C. Colton, Griswold, Man., Canada. my

FOR SALE—U. S. Patent No. 889,151, granted May 26, 1908. Street Car Fender. Has telescoping section to save persons struck by moving car. Address, H. M. Prater, Box 27, Crocker, Missouri. my

FOR SALE—U. S. Patent No. 927,356. Also Canada and Great Britain patent rights. Wonderful heating drum: throws all the heat down: absolutely no odors; burns half the gas of any stove of its size known. Will sell one or all three patents. For description, illustration, etc. address, Dr. W. S. Keyser, Everett, Wash. my

FOR SALE or on royalty—U. S. Patent No. 949,310, dated Feb. 15, 1910. This invention relates to a detachable button which is useful for all kinds of garments. Can be put through between the goods and locks itself. Can be taken off without leaving any mark. Also useful for uniform garments. Canadian patent applied for. Address, Joseph Tams, No. 208 Mulberry Street, Trenton, N. J. my

FOR SALE—Patent No. 910,950. Concrete Ornamental Lawn Fence. Very attractive. Will sell right or half interest. Pays to market. Full particulars with pleasure. Address, Box 9, St. Jacob, Ill. apr

FOR SALE—Patents Nos. 916,868, dated March 30, 1909, agricultural implement; Patent No. 911,983, dated Feb. 9, 1909, belt replacer; and 911,876, dated Feb. 9, 1909, cultivator. Inventions also covered by Canadian patents. Will consider proposition for royalty, or will exchange for land and part cash. For further particulars address, John Horinek, Atwood, Kansas. jy

FOR SALE—Patents Nos. 938,538 and 938,539. Railway Ties. Can be laid by one man. Once laid always in proper alignment. Can be manufactured anywhere by anyone. Address, Lewis Wylder, Cathay, N. Dakota. apr

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FOR SALE—Patent No. 857,075, dated June 18, 1907. Method of protecting corn or vegetable matter against weevils. Successfully tried. Will sell outright at a reasonable price. Address, Box 42, Peters, Texas. apr

FOR SALE — Patent No. 936,259. Combined shipping box, crate, and coop. Made of wood, sheet metal, or wire. When collapsed is only four times thickness of material used. Would let on royalty $500 bonus. Address, G. W. Sharp, Francis, Okla. apr

FOR SALE or royalty—U. S. Patent No. 909,952, dated April 27, 1909. Box or case. Simplest and cheapest, for cigarettes and like articles. Delivered singly through pressure. The box can be made from any material. Nothing similar on the market. Great novelty. Address, A. Tsakonas, 5801 Chestnut St., Philadelphia, Pa. apr

FOR SALE—Patent No. 583,494. Combination Book-Shelf and Book-Support. An excellent support. Easily applied to fit any shelf and books. Reasonable price. Address, August Lundberg, 41 Catherine St., Worcester, Mass. my

FOR SALE—Patent No. 935,255, issued Sept. 28, 1909. Baling Press. Triple stroke with automatic tripping attachment to trip the plunger at any time and withdraw same. Address, P. A. Guenzel, R. F. D., No. 3, Bartlett, Texas. apr

FOR SALE — The best Can Opener on the market, patented December 24, 1907, patent No. 874,457. Will sell outright at reasonable price. Would like to hear from any one who buys patents. For further information address, L. P. Therriault, Bonfield, Ont., Canada. my

WANTED.

WANED—To buy or manufacture on royalty a meritorious patented article. One in general demand preferred. Will deal with inventor only. Give description, terms and conditions. Address, Manufacturer, P. O. Box 754, Chicago, Ill. jun

WANTED—To correspond with patent owner of an article of merit, always seasonable, not perishable, and marketable any place. We manufacture and sell. Address, W. H. Davis & Sons, Newark, Ohio. my

WANTED—A company to buy or manufacture on royalty our automatic car coupling, U. S. patent No. 933,924, and Canadian patent No. 111,381. The best automatic coupling ever invented. Address, George Sarrazin & Hector Perreault, No. 653 Canal St., Holyoke, Mass. my

WANTED—1000 ratchet braces manufactured for cash or on royalty U. S. patent No. 878,404, issued Feb. 4, 1908, and after they are sold as many as the trade demands. Address, Israel Larson, R. F. D. No. 2, Box 179, Sandy, Utah. my

WANTED—Financial assistance in protecting and exploiting five inventions having originality and merit which will commend them to the countries of the world. Liberal interest will be given in the patents to be procured in exchange for the capital necessary for the making of models, incidental and other expenses. For full particulars address, John Horinek, Atwood, Kansas. jy

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SAVE THE APPEAL BOARD OF THE PATENT OFFICE!

ts Independence Must be Preserved.

For the benefit of those not familiar with the practice in the Patent Office, a brief statement of the jurisdiction of the Appeal Board—technically known as the Board of Examiners-in-Chief—is given. Upon the second or final rejection of any claim in an application for patent, the applicant has the remedy of an appeal to that tribunal. The Government fee is $10, and attorneys charge anywhere from $15 to $50 for preparing the reasons for appeal, orally arguing the case and writing the brief. Also when the Examiner of Interferences renders a decision awarding priority to one of two contestants, the defeated party may appeal to the Board. The Board either reverses or affirms the examiner's decision, sometimes in whole, sometimes in part. It has no law clerk, and has but one stenographer, but last year it passed on over a thousand appeals. If the applicant is still dissatisfied, he may appeal to the Commissioner of Patents, when the hearing is had before either of the two Assistant Commissioners, or before the Commissioner in person. It is customary during this hearing for the law clerk of the Commissioner to be present. On appeals to the Board, one member of the latter is assigned to write the decision of the three examiners who constitute it, after they have conferred upon the merits of the case. In hearings before the Commissioner, the law clerk usually submits a report and the Commissioner accepts or modifies it, and it becomes the decision on the appeal.

It has always seemed anomalous for appeals to be made from a tribunal composed of three members to a single official, and particularly to one who has perhaps recently assumed the functions of his office, and may be unfamiliar with the law and practice. Many Commissioners of Patents have observed this, and some have recommended a change. General Ellis Spear, in 1877, in his annual report to Congress, argued that the Commissioner be relieved of his judicial duties, and that said duties as well as those now devolving on the Board of Examiners-in-Chief, should be confided to a more permanent tribunal than any then existing. He said: "Such a tribunal has been suggested in the nature of a Patent Court, to be established in connection with the Office and to be composed of three members, appointed as other judges of the United States courts are appointed. To such a court an appeal from the adverse decision of the examiner might be directly taken. This would save one appeal, would relieve the Commissioner of all judicial duties, and would bring into direct connection with the Office a permanent judicial head. The Commissioner might then, with the assistance already provided by law, inspect the patents which he signs and refer to the court for revision such as might seem to him improper to issue."

This idea has grown with the passage of the years into a fixed opinion, among those conversant with the patent practice, that the present plan of two appeals within the Office should be abolished, and a single appeal substituted. Not only would this save money for the inventor both in Government and attorney's fees, but it would make the decisions of the appellate tribunal more binding and authoritative than they are now. A decision of the Board of Appeals is scarcely ever cited by an attorney in his argument before an examiner. This is partly due to the fact that the decisions are never published, and partly because the examining corps do not accept them as final, except in the particular cases in which they are rendered. Because of this fact, and to improve conditions within the Office, a bill has been introduced in Congress (H. R. 18, 885) providing for a single appeal by creating a new tribunal composed of the three members now constituting the Board, together with the Commissioner of Patents and the two Assistant Commissioners. The exact terms of the bill are:

"The Commissioner of Patents, the First Assistant Commissioner of Patents and the Assistant Commissioner of Patents and the Examiners-in-Chief shall be persons of competent legal knowledge and scentific ability, and they shall constitute a board of appeals, any three of whom, upon designation by the Commissioner, shall constitute a quorum, whose duty it shall be on the written petition of the appellant, to revise and determine upon the validity of the adverse decisions of the examiners upon applications for patents, and for reissues of patents, and in interference cases." In another section of the bill it is provided that they may be "removed from office at any time by the President for inefficiency, neglect of duty or malfeasance in office."

This bill is strongly advocated by the Commissioner of Patents, but is meeting with considerable opposition from attorneys and others. The difference of opinion is not as to the wisdom of abolishing one of the appeals within the Office, but as to the means suggested for effecting this purpose. As a Chicago attorney stated in a letter to the Congressional committee in charge of the bill: "I am heartily in favor of eliminating one of the appeals, but I think the method proposed of placing the board directly under the influence and control of the Commissioner, is radically wrong. The Commissionership is essentially an executive office, while the functions of the Board of Examiners in-Chief are purely judicial, and I do not see why the wise provision of the Constitution of the United States to the effect that the legislative, executive and judicial functions should be kept separate and vested in separate bodies. should be disregarded in this matter."

Mr. W. W. Dodge, one of the leading attorneys of Washington, in a letter filed with the Committee on Patents, said: "The profession generally, it is believed, favors the elimination of one appeal, but it desires this to be done only on some plan or basis which will give as thorough and careful consideration as obtainable to every case appealed, consideration by men as far removed from political pressure or influence as possible, and men who are required by the statute to be, as the Commissioner and Assistant Commissioners are not required to be, of competent legal knowledge and scientific ability; by men who shall determine every case on its merits according to their own judgment, in compliance with their oath, and without any influence, direct or indirect, from the executive head of the Office."

In the hearings before the House Committee on Patents, some unfair statements were made concerning the Board of Examiners-in-Chief. It was declared that they were a year behind with their work and were unable to attend to it in a proper manner. We know that this is at variance with the truth. The Board has not been, is not now, and is not likely to be, a year behind in its work. While we have sometimes thought that they occasionally refused patents which should have been granted, no one has ever had the slightest reason to charge or suspect that they were susceptible to any corrupt or improper influence, or that any such influence could cause them to modify their decisions. The independence of the Board has been one of its striking and wholesome characteristics. This has been demonstrated time and again. Receiving their commissions from the President and holding them practically for life, they are free of any political pressure that may be brought to bear upon the head of the Office. This condition is unfortunately too rare in official life, and the Board should be regarded as a model for other government bureaus, instead of being attacked. The record of the Board is above reproach. During its entire history of forty years, no one has ever questioned the integrity of its members, or suggested the possibility of underhand influence. From personal experience in many appeals, we can state without qualification that they always endeavor to ascertain the facts in each case, in order to reach a just decision. Similar testimony is offered by letters from attorneys practicing before the Office, presented at the recent hearing of the Committee, uniformly bearing witness to the high character of the Board and arguing for a continuance of its independent existence. What should be done is to strengthen it, instead of lessening its power. The appeal from the Board to the Commissioner should be abolished, and its decisions made final, with direct recourse to the Court of Appeals of the District of Columbia, in appeals from the adverse actions of the examiners on applications for patents or reissues, or in interference cases. There will be plenty of work left for the Commissioner and his Assistants, in the numerous petitions and motions presented to them. By freeing them from the other appeals, they will be enabled to dispose promptly of the interlocutory matters.

It is impossible within the limits of this article to present all the arguments that could be made against this bill. One practical objection which was urged by Mr. Dodge is that it places in the hands of the Commissioner, a bureau officer, power to shape and control the decision in any patent case, many of which involve hundreds of thousands of dollars. To place such power in the hands of an honest man is to subject him to a temptation which should not be offered; to place it in the hands of a corrupt man is to invite scandals which would make even the Heaney case seem trifling.

Another drawback to the measure is that it practically legislates into a life tenure of office the present Commissioner and his two assistants. We do not believe in a life tenure for positions of this character. There is no higher authority on patent questions than Albert H. Walker, the author of "Walker on Patents." Writing to the chairman of the Committee on Patents, he says: "I do not approve of the last three lines of the proposed amendment to section 482 of of the Revised Statutes, because that language is useless unless it carries the implication that the Commissioner and the other officers mentioned cannot be removed by the President except for inefficiency, neglect of duty or malfeasance in office, and because if that language does carry that implication, it is highly objectionable. I feel very sure that any of those officers should continue to be removable at the discretion of the President, without obliging him to prove or even to assert any reason whatever for such removal. This country has suffered seriously at times from the irremovability of federal judges; and though on the whole it has probably suffered less than it would have done if those judges had been removable at the discretion of the President, I feel very sure that the principle of irremovability ought not to be extended to

cover any executive office except clerkships and other minor positions, the duties of which are mainly mechanical, and which therefore are properly assigned to the operation of the Civil Service rules, including examinations before appointment. New brooms sweep clean, new blood energizes organisms, and new Commissioners of Patents similarly improve administration."

The bill should be defeated as it stands, unless it can be amended to remove the objections noted. Every inventor, every patent attorney, every manufacturer is vitally interested in this bill, and each should use his influence with his Member of Congress and Senator to see that it is amended or defeated. Copies of the arguments before the House Committee, and copies of the bill itself, may be obtained by any one upon writing to the Committee on Patents, House of Representatives, Washington, D. C., and asking for them. They will be mailed free of charge, and will furnish interesting reading to those who care to learn the details.

Shipping Fruit Without Ice.

Simple methods are in use in parts of England to preserve fruit and eggs for shipment without the use of ice. Products are kept fresh for days at small expense. The fruit is plucked at height of sun, to avoid all adhering dampness, and is immediately packed in prepared cases holding granulated sugar. Care is taken that the sugar should be also devoid of moisture, and the cases are so constructed as to be as nearly as possible impervious to atmospheric vapors. Both the sugar and the cases, as may be inferred, should be designed for and admit of constant re-use. Successful results, it is declared, follow the adoption of this method, which as yet has been tried only on a small scale.

Single-Process Smelter.

The copper-bullion turned out from a single-process furnace, constructed to test the commercial practicability of a new process, promises to radically alter the smelting industry. The furnace, which was built as an experiment near Garfield, Utah, has been declared an unqualified success. Pure copper rolls smoothly out of the plant, produced by a method that is declared by those who have seen it to be ridiculously simple. When the trial run was made, the nominal capacity of the furnace was 100 tons a day, and it was run at the rate of 150 tons without a hitch. Ability to turn out copper matte from a plant costing $12,000 had already been demonstrated; but this was the first production of blister copper. Matte carrying 60 to 80 per cent copper was produced repeatedly in half an hour from the time the concentrates were fed into the furnace. The inventor asserts that bullion can be made with equal facility, and expert smelter men present declare the process a commercial success. The new method reduces the cost of smelting copper to 25 per cent of the expense of the one formerly employed.

Safety-Valve Fuse.

When the pressure in a steam boiler reaches the danger point, beyond which it would be apt to burst, the steam opens a valve and escapes. Thus the very pressure that constitutes the danger furnishes also a refuge from it. In a system of electric wiring, the fuse plays a somewhat similar part, for when the current becomes strong enough to do damage, the fuse melts and breaks the circuit. The noise and flash caused by the "burning out" of an electric fuse are somewhat startling, but like the sudden hiss of steam from a safety valve, they are a sigh of relief, not a note of menace. The likeness between a fuse and a safety valve, however, is not complete. When the boiler pressure is lowered to the safety point, the valve closes and all goes on as before. The burning out of the fuse, on the contrary, cuts off the current altogether, putting a stop to the operation of the system until a new fuse can be inserted.

A recently discovered property of some metals, such as aluminum and magnesium, however, makes it possible to construct a real electric safety valve, which is already in use on transmission lines of high voltage. If two aluminum plates be immersed in any one of various liquids and a current be sent through the combination, the flow lasts only the fraction of a second, for an insulating oxide is formed on the metal surfaces. An increase in voltage causes a short resumption of flow and another stoppage due to a thickening of the insulating layer. This goes on until the current reaches 400 volts, when the insulation is permanently broken down.

By coupling several cells in series, this limiting voltage may be increased as desired. Thus a series of ten will not allow the current to pass freely below 4000 volts. If such a series be connected to a transmission line at one end and to the earth at the other, it will divert part of the current to the ground as soon as the voltage exceeds 4000, and "close up" again when the pressure drops below this limit, thus acting precisely like the safety valve of a boiler.

New Method of Anaesthesia.

Insensibility to pain has in the past been produced by the use of ether or chloroform, which cause a sort of lifelessness of the whole being, with the absence of consciousness in nerves as well as in mind; or through such drugs as stovaine or cocaine. These latter are applied to the part to be cut, and produce local anaesthesia, without affecting the general system. They have not always been successful in their action, and ether and chloroform are known to be dangerous to persons with a weak heart. It is therefore encouraging to learn of the discovery of a Hungarian physician that when stovaine is combined with a certain proportion of strychnine, and the whole injected hypodermically, the latter serves to keep the heart action normal while the stovaine induces complete anaesthesia of the part on which it is desired to operate. This will be a boon to a large class of sufferers requiring surgical attention, but whose powers of resistance are low and whose ailments are in regions not reached by local applications of cocaine and its kindred drugs.

The injection is made in the vertebrae, which causes paralysis of the nerve system, while not interfering with the consciousness of the patient. For operations above the heart, the injection is made just below the neck: for those below the heart, at a point located at about the line of the waist, beneath the lowest rib. Dr. Jonnesco, the discoverer, declares that puncture of the membrane enveloping the spinal cord is harmless, as he has performed the operation many hundreds of times with no ill effects whatever: and that the fear of pricking the cord is not only unfounded, but if it did happen, would not lead to serious results. The doctor, who is a wealthy man and a philanthropist, has given his discovery to the world, announcing the exact proportions of the two drugs to be used. The instruments employed are within the reach of any physician. The discovery is really a method, not a drug, and it promises to be of almost as great benefit to humanity, as was the original realization of the beneficent properties of ether and chloroform.

In test operations performed before audiences in New York composed of surgeons, the method proved brilliantly successful. It is adapted either to speedy or to slow work and the after effects are not injurious. The patients were able to watch the work of the operator, and to comment thereon. When asked if they felt pain, they answered that while they knew what was going on, they felt nothing whatever.

Road Indicator for Motors.

Whoever has traveled in an automobile on a hot summer day instead of in a close, stifling railroad car, says *Country Life*, will never go back to the latter if he can avoid it. The automobile, however, does not run on rails like the train but must be guided, and the driver faces a difficulty in finding his way on the road and through the different towns and villages which he has to pass on his journey. Even the best automobile map will only indicate which road to choose, and will not tell the driver whether he is facing that road or a similar one. Before turning into it, it is necessary to identify it, which means stopping the car and looking up the sign posts, or asking some one for advice. At night the problem becomes still more serious. A road indicator eliminates all these drawbacks. The owner then knows at any time where he is on the road, and need only wait the signal of an electric alarm bell (which always rings 200 yards ahead of sharp turns, railroad crossings, etc.,) and follow the accurate indication of the apparatus.

The indicator consists of a simple metal box which is placed on the dash board before the driver and connected with one of the front wheels of the car, by means of a flexible shaft similar to the arrangements used in speedometors. The map is printed on a long strip of transparent paper wound on a spool on one side of the box and moving toward the other side in proportion to the distance covered. Of course for each trip there is a special map. The system is as follows: The center line represents the road on which the car is travelling. All the roads marked above that line mean "to the right" and the roads marked under the line, "to the left." Side roads and cross roads are made in red: roads to take are in solid black: railroads are in black with thin lines across. Towns and houses are red, rivers and lakes blue, forests and gardens green. All roads are shown leading off at their actual angles. Once the driver turns into the proper road, however, he goes straight ahead, and then the center line again represents the road on which he is travelling.

On the right hand side of the box under the glass door a thin wire is fastened across. This wire is stationary, while the map moves all the time toward it. Any road bridge or railroad crossing on the map, when appearing exactly under the line, will correspond with the place on the road over which the car is passing at that moment. The driver therefore will always know, when he looks down at his indicator, just what road he faces and what village or town he is passing.

When starting on a journey, the driver puts a "film" in the box, sets the map with the starting point directly under the cross wire, and switches on the apparatus. From that point on, the device will indicate automatically all it is necessary to know on such a trip. It will also signal all dangerous turns, railroad crossings, etc. and so prevent bad accidents, which lately have been of daily occurrence.

Metal Ribbons.

There is a process in use in England whereby a metallic ribbon a mile long can be turned out in a minute. The molten metal is caused to flow through a nozzle in a thin stream upon the outside of a water-cooled drum that rotates rapidly. The metal solidifies immediately and is thrown off from the surface of the drum in the form of a continuous and uniform ribbon. It is possible to obtain the metal ribbons as thin as one-thousandth of an inch. The metals used in the making of different ribbons are aluminum, lead, zinc, tin, copper, silver and gold.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Glass plates, Device for fastening together...C. M. Conley
Glass roofs, Sash-bar for.....A. Windeknecht
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Glazier's putty-pane.....W. G. Coffin
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Governor.....J. Downey et al
Grain-pickler.....J. Wilhelm
Graphophones and like machines, Record-plate for.....W. C. Rhodes
Grate furnace, Chain-.....L. H. Maxfield
Grinding and separating apparatus.O. Porbeck
Grinding straight machine-knives, Machine for.....F. Franke
Gun, Breech-loading..C. P. E. Schneider et al
Gunpowder into particles or grains, Machinery or apparatus for dividing gelatinous.....G. H. Wadsworth
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Handle attachment.....H. J. Mulder
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Hay-loader.....J. A. Johnson
Hay-rack and box lifting device.....A. W. Sorenson
Hay-rake.....E. C. Smith
Head-covering.....N. A. M. Sands
Heating, cooling, and ventilating system.....J. C. Veil
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Hose-rack.....C. H. Fish
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Hub, Metal wheel-.....G. Mannes
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Insulating-support.....G. B. McBean
Insulating-tube.....M. L. Coffey
Insulating wall, Heat-.....C. J. Coleman
Insulation, Heat.....C. J. Coleman
Insulator.....E. Burton
Insulator-clamp.....W. G. Clark
Insulator for electric lines.....T. Varney
Insulator for electric lines, Section-.....H. F. Hoxie
Internal-combustion engine....P. D. Johnston
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Knockdown box, Collapsible.....C. F. Jenkins
Label-holder.....G. Peterson
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Looms, Smash-preventer for.....W. Lonzo
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Milk and cream can.....W. R. Clark et al
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Picture-frame, illuminating.....P. Roberts
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Pin-tumbler lock.....C. H. Thomas
Pipe-coupling clamping-ring.....J. Clark
Pipe-wrench.....J. R. Morris
Planter gage, Corn-.....L. P. Philippi
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Planter-shoe.....N. Klaus
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Plows, Row-maker for.....G. W. Brown
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Pole appliance.....T. H. Brigg
Pole, Cast-metal.....C. G. Ette
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Post-forming mold.....W. W. Bailey
Post-mold.....R. A. Leonard
Powder-grains, Machine for perforating and forming celular.....H. Maxim
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Printing mechanism.....W. A. Pringle
Printing-plates, Press for stamping raised characters on.....H. Pautze
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Seal, Car-.....W. V. Goodnow
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Spark-plug.....J. E. Schaefer, Jr.
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Sprocket-wheel.....F. W. Schandoney
Stalk-cutter.....M. E. Clanton
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Coal, Utilizing buried.....A. G. Betts
Coffee, Caffein-free.....R. Hübner
Coke-oven construction.....W. H. Blauvelt
Coke-ovens, Construction of gas-discharging devices for retort.....W. H. Allen, Jr.
Coke-ovens, System of beating-flues for retort.....W. H. Blauvelt
Columns, Protecting submerged supporting-.....S. G. Hindes
Commutator for dynamo-electric machines.....F. W. Young
Concrete construction.....W. J. Edwards
Concrete construction.....J. E. Conzelman
Concrete floor construction....F. W. Stevens
Concrete plant.....E. L. Ransome
Concrete reinforcement.....H. E. White
Concrete structure, Reinforced.E. N. Hunting
Container.....F. Westerbeck
Conveying apparatus.....J. H. Gilman
Copper-matte converter.....E. A. C. Smith (Reissue)
Copy-holder.....H. Hopkins
Corn-topping machine.....F. I. Bonham
Cotton and lint condenser.....A. J. Aderhold
Cotton-chopper.....R. L. Hartsell
Cotton-chopper.....J. T. Stepleton
Cotton-picker.....H. T. Noble
Cotton-picking machine...W. W. Farnsworth
Couch, Adjustable collapsible folding hammock-.....H. L. Hohnfeld
Coupling.....E. E. Gold
Coupling.....W. C. F. Zimmerman
Coupling.....E. E. Gold
Couplings, Apparatus for tapping.....J. H. Baker et al
Cracker-box.....A. L. Plotner
Crate.....H. H. Cummer
Crate or box, Folding.....F. E. Sterrett
Crushing-machine, 2 pats.....I. L. Mitchell
Cultivating and insect-destroying machine, Combined.....J. Peil
Cultivator shovel and fender...J. H. Bickhard
Culvert.....J. P. Dolan
Current-motor.....A. R. Brewer
Curtain-fastener.....H. Higgin
Cutter-head.....F. O. Wells
Cutting apparatus.....J. H. Wood
Cycles, Apparatus for utilizing the force of the wind for propelling.....J. Couder
Damper-clip.....C. D. Wagner
Desk.....J. A. Kennedy
Desk, Disappearing-top.....M. Toso
Dish-cleaner.....F. Schlabs
Dish, Oyster.....W. O. Coleman, Sr.
Display-can, Multiple-compartment...V. Ricker
Display-stand.....J. H. Jefferson
Display-stand.....E. T. Palmenberg
Dobby.....C. C. Forster
Door lock, Double-.....F. Lahr
Door, Sliding.....C. M. Donaldson
Door with non-concentric casing, Revolving..T. Van Kannel
Dough-molding machine.....F. Streich
Draft-equalizer.....J. N. Taylor
Draft-gear.....H. T. Krakau
Draft-gear, 3 pats.....H. F. Pope
Draft-gear, Radial, 2 pats.....H. F. Pope
Draft-gears, Buffer for radial...H. T. Krakau
Drain, Courtyard or area.....M. Schnaier
Dredging apparatus.....J. Ostervoid
Dress-shield.....H. R. Hinckley
Dressing-sack, Lady's.....L. Nathan
Drill-head.....J. F. Munn
Drop-light attachment, Adjustable.....F. K. Bartholomew
Electric-circuit controller.....H. D. James
Electric generating-machine.....E. M. Fitz
Electric machine, Dynamo-.....B. G. Lamme
Electric meters, Field system for motor.....C. W. J. Busch
Electrical connector.....S. B. Perkins
Electrical meter, Recording-.M. J. Wohl et al
Electrode.....J. W. Stubbs
Elevator.....J. A. Ashton, Sr.
Elevator signal system.....H. J. Heeney
Embossing-machine, 2 pats.....C. Owens
Embroidering-machine.....P. Meinelt et al
Engine cooler, Internal-combustion-.P. Weber
Engine-starting jack.....W. C. Byington
Engines, Cranking device for internal-combustion.....R. C. Hilton
Engines, Silencer for explosive.....P. A. de Grandsagne

Engines, Starting and stopping device for gas and other....T. W. Ellis
Envelop, Safety-....R. W. Brown
Explosive-engine....H. H. Wixon
Eye-shade....W. H. Degges
False spindle....C. M. Haeske
Fastener....C. Joseph
Faucet connection, Flexible....F. S. Skiff
Feed-box....E. O. Storelee
Fence....F. J. Lichty
Fence-machine....C. Kubach
File....R. Sellick
File and binder, Paper....W. A. Springall
File clip and plate....A. J. Tice
Fire-alarm, Automatic....A. W. Stafford
Fire-escape....I. Deatherage
Firearm....T. Consentino
Firearm, Repeating....T. Montmeny
Firearm safety device....J. M. Browning
Flash-back-stop tester....D. O'Keefe
Fluorescence of fluorescent substances, Apparatus of fluorescent substances, Apparatus for detecting and exhibiting the...W. . Levison
Flush-box....V. H. Hobson
Folding chair....C. A. Buffington
Foundry-flasks, Sand-retaining device for....A. Scrivenor
Friction brake and clutch....W. C. Marsh
Fuel, Manufaeture of....T. Parker
Fumigating attachment....E. L. B. Zimmer
Fuse, Ventilated....E. M. Hewlett
Fuse, Weatherproof high-tension.E. H. Jacobs
Fusible switch....G. W. Goodridge
Game equipment....C. B. Steacy
Garment-hook, 3 pats....F. E. De Long
Gas-engine....G. Dorffel
Gas-generator....C. E. Beeman
Gas-generator....E. R. Dull
Gasket for hose-couplings....R. S. MacEwan
Glass cylinders, Oven-pan for....A. P. Fees
Governor or regulator....F. J. Pearson
Grain-separating screen....F. W. Hasch
Grass-destroyer....G. A. Nelson
Grinding-machine....J. F. Lynch
Grinding-mill....J. C. Bowsher
Gum, Manufacture of chewing-.J. D. Darling
Gun-ramming apparatus....E. Schneider
Gun-sighting apparatus....C. P. E. Sehneider et al
Hammer, Drop-....O. Werner
Hammock, Settee-....H. L. Hohlfeld
Hat-forming press....C. W. Stevens
Hat-frames, Machine for forming wire....A. Feinstein
Hat-pin device....F. C. Chlan
Hay-carrier....S. L. Hanson
Heating system, Hot-water....E. Segesváry
Heel-attaching means for shoes...F. L. Rouse
Heel-nailing machine....E. Woodward
Heeling-machine nail-block templet....G. F. Stewart
Hinge....M. Hauser
Hoisting and conveying apparatus....T. S. Miller et al
Horse-detacher....C. B. Cummons
Horse-overshoe....J. E. Macdonald
Horseshoe....C. L. Funk
Hose-coupling....F. E. Thomes
Hot-air register....C. Clear
Humidifier, 2 pats....J. W. Fries
Husking and shredding machine.A. Rosenthal
Hydraulie jack....E. A. Gathmann
Hydroxid, Making solutions of cuprammonium....A. Lecoeur
Ice-creeper....C. C. Matz
Ice, Means for making artifieial plate-....J. J. De Kinder
Illuminated fountain....F. G. Jones
Indicator-generator for ignition purposes....H. J. and T. E. Podlesák
Inkstand with self-filling well....H. Klett
Insulator....W. T. Goddard
Insulator, Suspension device for.A. O. Austin
Internal-combustion engine....F. W. Brady
Iron ores, Reducing....C. B. Morgan
Irrigating-ditches, Head-gate for....D. A. Callaway
Kinematographs, Means for regulating the illumination of films in....B. Gwózdz
Ladder, Step-....E. Hudson
Ladle....J. V. Bretaud
Lamp-hanger....W. M. Ramsey
Lamps, Chandelier for gas-...T. J. Litle, Jr.
Lamps, Multiple socket for incandescent....F. J. Russell
Lantern-reflector, Detachable..A. N. Morrison
Latch....H. Hoffman
Latch for cut-out boxes....T. Q. Andrazyk
Lens-shaping machine....J. E. Germain et al
Letter and attaehment, Composite....E. S. De Puy
Life-buoy rack....C. E. Lenz
Lighting appliance....F. A. Feldkamp
Lightning-arrester....W. A. Binion
Linters' float....G. L. Blanchard
Liquid-fuel-vaporizing apparatus....F. J. H. Rustige
Lock....H. B. Zendil
Locomotive-exhaust....M. Speicher
Loom for weaving tufted pile fabrics....R. Simpson
Loom-shuttle....D. H. Beaird
Lubricating maehanism....W. L. Morris
Lubricator....P. Chilimidos
Lumber-sheet, Built-up....G. A. Wright
Magazine, Automatie....J. Sabo
Mail-bag catcher....I. Shreck
Mail-bag catching and delivering apparatus...G. W. Pomeroy
Mail-handling apparatus....J. P. and C. E. Guthrie
Mantles, Manufacturing incandescent gas-...E. Ross
Manure-distributer and dump-cart....G. W. Barrow
Manure-spreader....T. Brown
Manure-spreader....W. J. Cook
Manure-spreader....E. Palm
Marking and vending machine.F. C. Williams
Match-box holder....G. C. Lynch
Measuring-harness....F. De Feo
Measuring instrument, Electrical....M. J. Wohl et al
Measuring machine, Thread-....E. J. Rich
Mechanical movement, 2 pats..F. H. Richards
Metal bars, Machine for bending.R. Anderson
Metal body and making same, Compound....J. F. Monnot
Metal, Cast....R. C. Totten
Mine-anchors, &e., Mooring for..C. R. Gabriel
Mold-making machine....D. McKenzie
Molding-machine....W. W. Rowley
Motion, Device for converting reciprocating into rotary....H. C. Hammond
Motion, Mechanism for transmitting rotary....T. Brown
Motor....I. V. Moody
Motor-control system....F. H. Shepard
Motor-control system, Electric-.M. Hartenheim
Mucilage-receptacle....C. F. Phillips
Nipple-holder....S. O. Johnson
Nut-lock....S. H. Kyle
Nut-lock....W. M. Hord
Oil-burner....G. D. Will
Oil-burner....M. D. Mahanay et al
Oil burner, Crude-....J. B. Brennan
Optometer....I. Buckman
Ore-roasting furnace....H. W. Kent et al
Paper-cutter, Electric....P. L. Stohr
Paper-roll holder....W. H. Hoell
Paster and paper-hanger....W. A. Cronk
Pellicles, Continuous manufacture of....M. Ratignier et al
Pen filler, Fountain-....M. T. Fish
Perforating-machine feed mechanism....G. B. Kelly et al
Phonographs, &c., Making records for....W. Sanderson
Piano-action....F. B. Long
Picture-hanger....W. H. Fraser
Picture machines, Reflector for moving-....C. J. Paulson
Pipe-coupling....J. E. Costa
Pistol, Magazine-....C. A. Pattison
Pitman....W. Paterson
Plant-protector....A. G. McAdie
Plate-catcher....A. F. Warden
Plunger-lubricating ring....H. Ruth
Potato-cutter....H. E. Wells
Potato-cutter....E. Brown
Potato-digger....H. Rohrbach
Potato pulling or raising machine.E. V. Méline
Power-pneumatic....C. L. Davis
Press....N. C. Wallenthin et al
Printing address-strips, Machine for....R. W. Goeb
Printing-plates, Apparatus for producing depressions in metal....M. Wachsmundt et al
Printing-press attachment....H. E. Shedd
Printing-press gripper....J. W. Williams
Propeller-shaft hanger and bearing....J. W. Walters
Propelling mechanism, Detachable.J. F. Lesko
Protector, Portable....C. Carter
Pump driven by means of compressed or rarefied gas....O. Rodhe
Pump, High-speed compression and vacuum..M. Wenkel
Pump, Tire-....W. S. Stapley
Rail-joint....A. C. Herbert
Rail structure, Guard-, 2 pats...G. B. Taylor
Railway cattle-guard....G. F. Wood
Railway frog and switch....A. L. McMaster
Railway frog and switch....J. M. Street
Railway-motor....S. M. Kintner
Railway-rail joint, insulated....K. Kohn (Reissue)
Railway safety switch and signal device....H. M. Abernethy
Railway-track structure, 3 pats..H. F. Roach
Railway-wrecks, Device for preventing....J. G. Henzel
Railways, Highway-crossing device for electric....D. T. Fisher
Rammer and tamper, Hand....A. M. Lind
Ranges, Burner-support for gas-....H. P. G. Norstrand
Razor-hone....N. Salvato
Refrigerating plant....A. Kleine
Refrigerator....C. L. Haywood
Refrigerator....L. Doran
Resistance unit....E. N. Lightfoot
Reversing mechanism....J. R. Golter
Ringing-key, Selective....B. W. Sweet
Rocking-chair, Child's....A. W. Pressler
Rod coupling, Connecting-....J. W. Bready
Rolling apparatus, Plate-...M. W. Hogle et al
Rolling metal hars....I. L. Hughes
Rolling metal hars, Apparatus for....I. L. Hughes
Rolling metal sheets and plates....M. W. Hogle et al
Rolls, Feeding plates or sheets to cold....C. W. Bray
Rope-making machine....M. and S. Kjelstad
Rotary engine....J. Jagersberger et al
Rotary engine....J. Nielsen
Rotary explosion-engine....E. J. Conill
Sash-bar....T. F. McGann
Sash-slide....W. F. Gibbard
Sash, Window-....G. T. Polson
Saw-handle....E. M. Barton et al
Saw-set....T. F. Ward
Scale....N. Nilson
Scale, Weighing-....W. C. Carr
Scissors and shears....A. K. Chapin
Score-board....J. P. Keenan
Scraper, Road-....T. and A. A. Addison
Screen sizing and separating machine....J. M. Callow
Scruff and dross, Reduction of....R. S. Wilc
Seal-lock....J. T. Hunter
Sealing bottles....C. N. Trevander et al
Seat-frame....C. A. Lindström
Seating....W. Franks
Seeder attachment....H. Brown
Separator....J. Muchka
Sewage in sewage plants, Ventilation and aeration of....F. Hamilton
Sewing-machine....T. G. Plant
Sewing-machine combination pressure-foot and trimming attachment....I. Weinbach et al
Sewing-machine guard....L. Schreiber
Sewing-machine needle, 2 pats....J. French
Sewing-machine, Two-reel....D. Flanagan
Shade-rollers and curtains, Adjustable support and bracket for....T. E. Johnson
Shaker, Combination-....H. J. Turner
Shaping-machines and the like, Speed-box for....M. Flather
Sharpening the rotary circular knives of meat-slicing machines, Device for....W. A. Van Berkel
Sheet-metal articles, Machine for making....B. Adriance et al
Shingle-stamp, Automatic....G. A. Ortwein
Shirt....C. W. T. Davies
Shirt holder and protector....E. W. Glauber
Shock-absorber....E. C. Wileox et al
Shoe-polishing machine...G. C. La Mountain
Shoe-tree....C. B. Kosters
Shovel and coal-receptacle, Combination....N. R. Middleton
Shovel bolster, Steam-....W. Sheppard
Shutter....M. Klaiber
Sifter, Flour-....G. McEachron
Sign....G. C. Nientimp
Silo....W. A. Holnagel
Siphon....W. B. Gadsden
Skirt....S. Cohn
Sled-brake....H. A. Denny
Smoker's article....J. R. Ring
Snap-hook....F. E. Schartow
Snap-swivel....R. S. Beaver
Socket-shell-cap fastening....H. Hubbell
Sound-reproducing deviee....J. C. English
Sounding-fork vibrator, Electrical...I. Müller
Spark-arrester....A. G. Leave
Splice-bar....F. A. Schroeder
Spoke-socket....J. Markwick
Staircase, Metal....C. F. Steiber
Stanchion, Cattle-....M. Murphy
Station-indicator....C. C. Cochran
Still, Turpentine-....B. Hart
Stone-crushing machine....I. L. Mitchell
Stool, Shoe-salesman's....O. H. Moore
Storage battery....W. M. Jackson
Storage battery....J. E. Haschke
Stove-lid....A. L. Castle
Stovepipe-forming machine....G. Berghausen
Street-indicator....F. D. Carson et al
Striking-tool....W. C. Michael
Structure, Knockdown....F. T. Sullivan
Surfacing-machine....E. J. Bein
Surgical appliance....W. C. Yates
Surgical instrument....J. C. Goosmann
Switch....J. E. Sartoe et al
Switch....J. G. Arter
Table lock, Pedestal-....A. Carlson
Tag-fastener....C. M. Thalimer
Talking-machine sound-box....L. P. Valiquet
Tanning....J. M. Brown
Target-throwing device....L. A. Fridell
Teeth, Fastening means for artificial....T. E. Dimelow
Telegraphic transmitter....P. B. Delany
Telephone connection-registering device....D. S. Hulfish
Telephone-lines, Auxiliary signaling apparatus for....C. S. Winston
Telephone switch apparatus..S. A. Koltonski
Templet and gage, Combined....J. Sherry
Tenpin-bases, Machine for truing....E. and J. Adell
Tent, 2 pats....G. D. George
Thread-holder....W. J. Greene
Thread-holder....J. Rosenberg
Tie-plate....W. McKee
Tiling....E. T. Bates
Time-lock, Recording....J. F. Pixley et al
Timer....C. S. Martin
Tire....W. D. Harris
Tire-bolt tightener and cutter, Power....H. A. Krueger
Tire-case....P. Evans
Tire for automobile-wheels, &c., Emergency-..W. Budesheim et al
Tire, Vehicle-....L. E. Clawson et al
Tire, Vehicle-....H. S. Firestone
Tire, Vehicle-wheel cushion-....C. Weichelt
Toaster....M. A. Patterson
Toy gun....J. Scholtes
Track-sanding appliance....F. G. Schwartz
Train-order-delivering device...C. B. Hibbard
Transmission mechanism....W. C. Jameson
Transmitter....W. E. McCormick
Trestle....E. O. Vickers
Trolley-wheel....G. H. Downs
Trolley-wheel, 2 pats....C. W. Putnam
Truss pad or cushion....D. O. Fosgate
Tuhes or rods, Mechanism for treating metal or other....E. T. Greenfield
Tuhes or rods, Treating metal and other....E. T. Greenfield
Turbine, Steam-....W. E. Seelye
Turning machine, Channel-lip-..W. H. Hoper
Type-har-producing mechanism.F. H. Richards
Type-hars, Manufacturing....F. H. Richards
Type-bars, Producing....F. H. Richards
Type-writing machine....S. Nielsen
Type-writing machine....M. W. Pool
Type-writing machine....C. B. Yaw
Type-writing machine....A. J. Briggs
Type-writing machine....J. C. McLaughlin
Type-writing machine....E. B. Hess
Type-writing machine....L. C. Myers
Type-writing machine....G. A. Seih
Type-writing machine, Pneumatically-operated....M. Soblik
Umhrella....F. Benz, Sr.
Uncoupling device....H. T. Krakau
Universal joint....G. R. Long et al
Valve....T. R. Sundberg
Valve-controlling mechanism, Thermostatic-..H. Schneider
Valve, Hydraulically-operated....E. Sander
Valve stem or rod....C. Kiess
Valve, Tank-....A. D. Herschler
Vault, Burial-....J. T. Suit
Vault-cover fastening....J. Armstrong
Vehicle-Motor-....B. D. Gray
Vehicle-spring....L. Sgal et al
Vending-machine, Coin-controlled....F. Peters et al
Veneer drying and straightening machine....F. N. Morey
Vessels, Corrugated-metal wall for collapsible expansible....W. M. Fulton
Vise, Bench-....O. M. Eager
Voting mechanism, Question-....C. H. Ocumpaugh
Wagon-dumping apparatus....G. E. Wunder
Washing-machine....F. Stines
Washing-machine....W. R. Kramer
Washing-machine....J. Vierling
Washing-machine....L. R. English
Washing-machine....W. A. E. Henrici
Washing-machine cylinders, Sliding door for..F. M. Raymond
Washing-machines, Sliding door for outer eases of sterilizing....F. M. Raymond
Water-heater....F. J. Randall
Water-heating apparatus....W. W. Rieh
Watering-trough....B. R. Spencer
Wave-motor....C. O. Blauel
Weed-burner....P. G. Davidson
Weigher, Fruit-....G. D. Parker
Weir, Prorating-....D. A. Callway
Whip lock and socket, Combined...S. Lilland
Winding-roll speed-regulator..S. L. Nieholson
Window gutter and flashing, Show-....H. H. Treffer
Wire-forming machine....L. R. Compton
Wire-stretcher....C. T. Newland
Wires or conductors, Connection for....E. Schmidmer
Wood, Bath for extracting products from....F. Pope
Woodworking-cutter....K. J. Spieth
Work-table for hars, soda-fountain counters, &c....J. J. Retzgold
Wrench....H. A. Pacquette
Wrench....S. O. Orr
Zinc oxid for reduction, Preparation of....H. Pape

DESIGNS.

Badge....M. A. Hudson
Badge....R. C. Thompson
Box, Wooden....W. C. Estes
Burial-casket handle....C. Bleseh
Cabinet or similar article....C. N. Wheaton
Chair....L. Killian
Crumb-scraper or similar article....A. H. S. Swan
Glass receptacle....A. J. Sanford
Hand-bag....I. J. Levy
Lamp, Automobile-....H. Futterman
Lamp, Candle-....P. Ebeling
Light-shade....A. J. Sanford
Mirror or similar article....S. B. Beach
Rug....C. L. Fetterly
Rug....J. Merry
Spoon, fork, or similar article..W. A. Jameson
Statuette....G. MeManus

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MECHANICAL PATENTS.

Acid and making same, Indanthrene monosulfonic....R. Bohn
Acid and rpeparation of same, Ester of diglycollic....L. Ach
Adjustable coupling....F. Hanson
Adjustable reel, Automatic....C. H. Coon
Advertising device....E. A. Lyon
Aigret and like article, Artificial....M. Veit
Air-compressor, Electric....A. F. Batchelder
Airship....A| Crane
Alarm system....O. B. Kaiser
Apparel, Mechanical clasp partieularly adapted for wearing-....C. M. Friend
Armor for battleships....E. P. Watson, Sr.
Ash-pan and blower, Combined.T. L. Gabbard
Ash-receptacle....D. T. Bjork et al
Autographic register....A. Krauth
Automobile....T. A. Edison
Axle-box....S. T. Bole
Axle for motor-vehicles, Supporting-....B. D. Gray
Ballot, Mechanical....D. L. Newcomb
Battery-box....R. W. Magna
Bean-sorting machine....J. O. Adams
Bed....F. M. Wilson et al
Bedstead....M. G. Merritt
Bedstead....O. R. Hunt
Bedstead-eorner....B. Shapiro
Belt-lightening deviee....M. J. Stauffer
Berth, Sleeping-car....L. J. Berg
Bicycle attachment....G. T. Sampson
Billiard-cue-chalking deviee....J. C. Morrison
Binder and puneh, Loose-leaf...J. S. MeComb
Binder, Looseleaf-....C. F. Hudnall
Binder, Publication-....E. B. Arnold
Binders, Extensible post or pillar for loose-leaf, 2 pats....J. S. McComb
Binders, Support for leaves of loose-leaf....J. S. McComb
Blacking machine, Boot-....A. T. Peffer
Body-brace, 2 pats....R. F. MaeClemmy
Boiler....G. Engel
Boiler-cleansing apparatus....J. Zetka
Bolt-heading machine...S. D. and H. T. Latty
Boot and shoe uppers, Forming....K. Engel
Bottle-cap container....F. Recht
Bottle, Non-refillable....G. A. Roberts
Bottles, Wiring....O. Topp
Bowling-cabinet....R. H. Mulford
Box-making machine....E. H. Taylor
Box-opener and nail-puller, Combined....F. T. Lestage
Box-opening device....G. C. Weber
Brake....W. E. Baldwin, Jr.
Brake lever, Vehicle-....J. M. Custer
Brake-shoe holder....G. W. Maples
Brine-cooler....G. Knox
Buckle....J. R. Kidney
Buckle, Ornamental suspender-....E. N. Humphrey
Buggy-boot spring....T. Sizer
Bullet, Expanding....J. Schenk
Bundling-machine....C. Owens
Bureau, Portable....O. Rangnow
Burner....C. C. and H. W. Foote
Button-machine....J. W. Miller
Calculating-machines and the like, Carrying mechanism for....D. W. Shiek
Calendar....J. C. Vaughan
Cam-and-tappet meehanism....E. A. Wall
Can spout, Oil-....A. P. Hurt
Cane- Walking-....L. Alverson
Cap....H. C. Finestone et al
Car attachment, Logging-....W. B. Brown
Car-coupling attachment....J. W. Jackson
Car-coupling uncoupling device.J. R. Carmer
Car-door....P. J. A. Schnoor
Car-door fastening....P. P. Peakes et al
Car-door-operating deviee....A. Christianson
Car draft-rigging, Railway-....C. S. Shallenberger
Car-dump....G. O. Bradley
Car-fender....J. F. Risdon
Cars, Air-intake for....H. W. Leeds
Card system....N. L. Mèlancon
Carpet-cleaning machines, Pumping mechanism for....W. Schussler
Carriage, Collapsible baby-, 2 pats....A. W. Loshbough
Cash-carrier, Pneumatie....W. H. Upham
Casting, Mold for hollow....W. T. Bausmith
Cellulose, Manufacture of....E. Morterud
Cement wall....G. H. Pegram
Cesspool and trap....J. G. Hayes
Chairs, Hat-holder for theater-..H. H. Wilton

Chalk-line holder....J. D. Eastman
Channel-kiln....G. E. Öhrn
Check, Sales-....E. G. Lindsay
Churn....W. H. Brown
Churn-top....L. Lewis
Cigar-bunches from molds, Machine for removing, 3 pats....O. Tyberg
Clamp....W. L. Glidden
Clevises, Pin-locking means for..G. E. Mills
Clutch....R. W. Butler
Coal preparatory to coking, Treating and handling....W. J. Patterson
Cock, Plug-....H. J. Richard
Cock, Regulating-....W. N. Best
Coin-controlled lock...W. S. Farnsworth et al
Coin-freed lock for caretakers....P. Kopal
Computing-machine....A. Z. See
Concrete tank, silo, cistern, and the like molding-machine....H. G. Moats
Condenser....G. B. Petsche
Conveyer....J. Ashford
Cooker, Steam-....H. A. Stoddard
Cooking device with heat-regulator, Gas....H. Junkers
Copper and copper-nickel ores, Treatment of pyritic....J. T. Carrick
Corn-husker....J. A. Stone
Cover-blank and box....T. A. Riley
Cultivator....F. Upshaw
Cultivator, Lister-....T. S. Warner
Cultivators, Harrow attachment for....T. Horne et al
Cupboard and table-closet, Combined....L. P. Armstrong
Curb-box....A. J. Tyler
Current-breaker, Rotary....H. Ruthardt
Cushion-edge support....F. H. Hampton
Cycle-belt tightener, Motor-....G. H. Meiser
Cycle, Motor-....L. D. Robinson
Decorated fabric, 2 pats....J. A. Groebli
Dish-washing machine....I. L. Frankem
Display apparatus....T. Lennox
Display-rack....J. A. Bogar
Dividing circle or acres of circles, Device for....A. D. Ide
Door-catch....W. D. Taubert
Door, Cellar-....W. E. McKibben
Door-check....P. Dumont
Door-hanger....J. Olman
Draft appliance for fireplaces.S. A. D. Doane
Draft-equalizer, 2 pats....W. Elliott et al
Drum muffler, Snare-....M. Waechtler
Dust-separator....C. C. Wickwire
Dye, Red basic....W. König
Dye, Red to violet wool....M. Weiler
Egg-beater....C. W. Fisher
Egg-tray....D. D. Granger
Electric circuits, Apparatus for alternating the polarity of current in....G. Babcock
Electric furnace....J. H. Reid
Electric fusible cut-out....E. Schattner
Electric-light fixture....W. A. Hutton
Electrical time-limit switch....P. K. Stern
Electrically-wound mechanisms, Contact device for....B. F. Kessler
Electromagnetic waves with sound-regulated frequencies, System for the transmission of....W. H. Bathrick
Electroplating apparatus....W. R. King
Electrorheostat-regulator....H. Gernsback
Elevator....L. Kantor
Embalming apparatus....W. B. McCourtie
Eraser, Blackboard-....H. W. Mitchell
Excavating-machine....G. Holmes
Exhaust-pipe....J. Player
Fastener....G. Jones
Fasteren....C. J. Lubeck
Feed-pan, Poultry....G. F. Lewis
Feeder, Stock-....D. T. McKinnie
Fence-making machine....J. A. Reck
Fence-post....L. A. Nelson
Fertilizer and producing same..L. R. Coates
Fertilizers, Producing, 2 pats..L. R. Coates
Filter....C. Sellenscheidt
Filter-press....B. Berkovits
Filtering apparatus....N. Marie
Fireproof arch....E. F. Fitzpatrick
Fireproof-shutter mechanism....F. McManus
Fishing-reel....J. H. Scotchmer
Floor grinder and polisher....B. F. C. Jacobs et al
Flue-cleaner....C. W. Hadlock
Fluids, Process and apparatus for the interconversion of kinetic and potential energy in....S. Z. de Ferranti
Flying-machine, airship, and the like....V. Wisniewski
Foldable table and attachment therefor....H. F. Thomas
Folding-machine....J. Tomlinson
Food boiler and steamer....P. Wiegand
Force-feed lubricator....E. Tilston
Forging-machine....G. Berglund
Funnel....F. G. Kollenberg
Furnace-door-operating device.O. M. Gossett
Furnace fire-door....G. H. Gregory
Furnace for melting metals and for like purposes....J. C. Barker
Furnaces, Gas-burning attachment for....J. F. Coyle
Furnaces, Means for controlling draft-air to boiler-....L. Duffner
Fusing process....S. Meissner
Gage....W. Jòrgensen
Galosh, gum boot, and other rubber footwear....D. and F. W. Smith
Game apparatus....O. C. Miller
Game apparatus....C. F. Doerr
Garment, Nether....G. Durichen
Gas-cleaning apparatus....J. Morgan
Gas generator, Acetylene-....A. Dér et al
Gas-producer....J. Reuleaux
Gases, Utilizing nitrous....K. Birkeland
Gasolene-feed....A. W. Hofacker
Gate....I. L. Landis
Glove-cleaning machine, Kid-..H. F. Marshall
Gloves and the like, Fastener for....J. H. Fisher
Go-cart, Folding....E. and F. F. Timmerhoff
Gold, Apparatus for recovering fine....J. H. Alling
Gold, Recovering fine....J. H. Alling
Golf-club....W. D. Kilgour
Golf-links, Cup or hole-rim for...H. Hinckley
Grease-cup-filling device..J. W. Faessler et al
Grinder, Sand-....G. R. Bilz
Gyratory machine....J. Fraser
Hand-bag....J. Erstling
Hand-clamp or vise....F. H. Kelley
Harrow....A. M. Hauck
Hay or manure loading machine....H. G. and W. J. Collins
Hay-press....G. W. Wilson
Hay-rake....J. Dain
Hides and skins, Machine for treating....D. P. Cummings
Hinge....G. Olson et al
Hinge....O. R. Milke
Hobby-horse....A. E. Smith
Hoisting and conveying apparatus, Semi-portable....A. Lambert
Horseshoe....I. G. Owens
Hunting-knife....C. Romano
Husking-roll tooth....T. L. Brumback
Ice, Apparatus for making artificial....W. B. Bull
Identifying device....G. W. Lott
Index cabinet, Card-....E. Ohnstrand
Indicating mechanism....D. E. Scrafford
Indigo and making it, Halogenated....P. E. Oberreit et al
Insulator....W. S. Cone
Insulator, Electric-light-pull..T. M. Harrigan
Internal-combustion engine....E. C. Bennett
Internal-combustion engine....F. Reaugh
Jewel-bar....H. W. Fishel
Jewelry....H. W. Fishel
Journal-box for mining-cars....W. H. Bines
Key and lock....C. F. Jenkins
Knitting-machines, Splicing-feed device for..G. S. Marville
Labeling packets, tins, or the like, Machine for....E. C. Lovell
Lace clamp, Shoe-....J. C. and A. M. Foster
Lacing-hook-setting machine...F. L. Cheney
Ladder and trestle, Extension.W. L. Glidden
Lamp, Electric-arc....T. J. Rensing
Lamp, Projector....J. W. Kellogg
Lamps, Ball-clutch for arc-....J. T. Beechlyn
Last....E. O. Krentler
Last....S. T. Hennessy
Lasts, Jig for boring jack-holes in....W. H. Baynard
Lasting-machines, Holddown attachment for..E. F. Heffernan
Latch, Door-....G. Wettig
Level attachment for straight-edges....O. H. Lund
Light-sensitive layer-carriers and film structure therefor, Device for exposing....J. Schmuck
Lime and gas, Manufacture of...G. G. Floyd
Line-casting machine....R. F. Mercer
Line-supporter....H. W. Wells
Linoleum, Manufacture of....W. D. and D. L. Snow
Liquid-cooler....E. Russell
Liquid-fuel burner....F. C. Richardson
Liquid-treating apparatus....K. W. Bartlett
Loading apparatus....R. C. Gilse
Lock....J. W. H. Taylor
Lock....A. Reinikka
Lock....J. Junkunc
Locks, Stop-work mechanism for....C. A. Berry
Locomotive, Electric....W. E. Woodard
Locomotive-engine....H. D. Taylor
Locomotive exhaust-pipe....J. Player
Loom shuttle, Cotton-....V. Levèque
Loom take-up mechanism....A. E. Rhoades
Lubricating axle-boxes and the like, Means for....A. J. Smith
Lubricating device....E. Hutton
Lumber, Siding....G. V. Cesinger
Mail-bag deliverer....M. N. George
Mail-bags and similar articles, Closure for....A. Hormel
Mail-delivery chute....J. and H. Page
Mail-handling device....J. H. Buchanan
Mailing-receptacles, Card attachment for....A. R. Bingham
Manifolding devices, Carbon-holder for....E. E. Everall
Massager....A. R. Campbell
Match-machine....C. A. Tatum et al
Match-safe....J. S. Nicholson
Measuring and weighing machine, Grain....C. D. Cromley
Measuring-machine, Grain-....C. D. Cromley
Merry-go-round....J. S. Tuttle
Metal-frame screen....S. W. McGrath
Metal manufacture, Expanded-...N. E. Clark
Metallic silicids, Manufacture of...G. Strauss
Metering panel-board....J. J. Agutter
Milk-can....L. R. Steel
Milk-can, Glass-lined....L. R. Steel
Mill spindle, Grinding-....A. M. Tully
Mirrors, pictures, or other small objects, Means for supporting....C. B. Moore
Miter-box....W. Potter
Moistening device....P. H. Lombard
Molding-box....A. Schrag
Molding-flask drag....W. Fawcett
Mop and hardwood-floor device, Combination..E. T. Baskin
Motive-power-producing machinery.C. Tellier
Motors, Speed-multiplying mechanism for....A. L. Heglar
Musical instrument, Mechanical.R. Frömsdorf
Mutoscope....A. S. Ferguson
Needle-case....J. S. Gardner
Nickel and copper from ores and mattes, Recovering....A. Chalas
Nozzle, Exhaust-....J. Player
Nozzle for steam-boilers....W. Horsley
Nut-cracker....S. C. Peckham
Nut-lock....A. A. Brown
Nut-tapping machine....J. Boma
Oil-burning system....H. Duke
Oil-switch....H. L. Smith
Organs, Electric coupler-action for....J. O. Funkhouser
Packing, Rod-....P. Dorsey
Padlock, Combination-....L. L. Kellogg
Padlock, Combination-....L. Rosen
Paper and other substances, Decorative treatment of....H. C. Mitchell
Pencil-holder....J. G. Watanabe
Pencil, Mechanical....G. Arends
Pencil protector and sharpener, Combination..T. Goodair
Percolator, Coffee-....P. Edtbauer
Photographer's chair....C. E. Herman
Photographic tray....W. G. Rice
Photography, Color-....F. L. Dyer
Piano-shield....M. J. Bean
Pipe-joint-packing machine...C. E. Miller, Jr.
Pipe-machine....C. R. Burlingame
Pipe-threading machine....D. C. Walter et al
Planter, Corn-, 2 pats....J. C. Coleman
Planter, Corn-....J. N. Stout
Planter, Cotton-....J. Clark
Plow attachment....S. B. Evans
Plow, Wheeled....W. L. Paul
Plug, Attaching-....J. C. Dallam
Plug, socket, and switch, Combined electric connecting....W. W. Buckton
Pocket-knife....I. Kinney
Post-hole digger....E. Sutherland
Pot-handle, Pivotal....P. Rotondo
Powder-box....W. H. Perkins
Powder-ejector....C. W. Kline et al
Presser-foot....C. A. Potter
Printing machine, Ticket-.A. Stenhouse et al
Printing press, Web-....F. M. Turck
Projectile, Aerial....R. Lehmann
Pruning implement....C. I. Libby
Pulley, Split....W. H. Stockham
Pump....J. B. Garber
Pump....W. H. Heard
Pump, Centrifugal....F. W. Krogh
Pump-coupling....B. F. Mohr
Pump, Multistage centrifugal....A. Giesler
Pump, Rotary mercury vacuum-....H. A. Fleuss
Pump-valve....G. Clark
Pumps, Counterbalance for water-....W. Koethe, Jr.
Pumps, Valve-cage and valve for.J. B. Garber
Pumping apparatus....F. S. Hebden
Pyrotechnical button....A. Jedel
Quoin....J. W. Talbot
Radiator....W. Wilkinson
Rail-joint....F. W. Krueger
Rail-joint....A. A. Lind
Rail-joint....J. K. and B. W. D. Gorrell
Rail-joint....A. C. Jenrich
Rail-laying apparatus....J. Reinehr
Railway-spike....J. Dellwo
Railway-switches, Combined signal and lock for....T. B. Ashford
Railway-switches, trap-doors, &c., Trip device for operating....F. M. Evans
Railway-tie....J. S. Miller
Railway-tie and rail-fastening means....J. J. O'Donnell
Razor and stropper, Combined..F. H. Arnold
Reamer....C. J. Crowley
Reamer, Expansion-....W. C. Meyer
Reclining-chair....J. E. Trimble
Reflector....C. M. Fluke
Refrigerating apparatus....H. G. Scherer
Registers, Border for side-wall....J. Flood
Rein-button....E. G. Jegge
Rein-holder....A. Crossan
Rendering-tank and press, Steam....C. H. Stadler
Ring-gage....G. G. Warstall
Riveting-tool....J. C. Woberman
Rocket, Floating and luminous line-carrying..H. E. A. Guérard
Roofing, Ready-made....W. H. Pendery
Rosette, Fuseless....H. C. Wirt
Rotary engine....W. G. Sheppard
Rudder for controlling the various movements of screw-propelled vessels and means for operating same....J. P. H. Lund
Saddle, Harness-....W. C. Trask
Saggar....W. W. Babington
Sand-blast machine....C. A. Dreisbach
Sash lock, Window-....T. C. Staley
Sash-weight....C. A. Horner
Saw and handle for the same....J. Ullrich
Saw, bevel, and square, Combined....J. E. Larson et al
Saw machine, Drag-....R. J. McGhee
Saw-swage....A. E. White
Scraper, Wheeled....J. P. Robbins
Screw-threads upon screws, Machine for cutting....W. Avery
Sealing and stamping envelops, Machine for..F. O. Madsen
Seed linter and condenser, Cotton-....F. C. Gammons
Sewer-cleaning device....M. Harbeck
Shafts for vehicles, Shifting...W. A. Kitchen
Shaking-screen....C. W. Honabach
Sharpener for scraper-blades....J. F. Weber
Sharpener, Knife and scissors..M. E. Ingram
Sharpening device....G. P. Engelhard et al
Sheaf-carrier attachment....C. M. Hanna
Sheet-metal box....C. T. Wootten et al
Shield....J. A. D'Andelet
Shipping case or box....T. T. Copeland
Shirt, Combined athletic....W. T. Anderson
Shock and hay loader....J. Cocking
Shoe-tree, External....H. Stone
Shoes, sandals, and the like, Making....A. B. Eastwood
Sight-feed lubricator, Down-drop....F. W. Edwards
Skiving-machine....F. L. Alley
Skiving-machines, Pressure-roll for....F. L. Alley
Sled and propelling apparatus...A. J. Offord
Sleeve for garments....S. Karp
Smelting-furnace....J. S. Loder
Snap-switch....H. P. Ball
Socketed members, Securing means for....A. W. Cochran
Soil antitoxin, Making....L. R. Coates
Soldering the end seams of cans, Means for..W. J. Phelps
Sound-reproducing-machine record....D. H. Haywood
Spectacle-cases, &c., Sofety-clamp for....J. W. Trulove
Speed mechanism, Variable..H. W. Schwartz
Speed transmission mechanism, Variable-....H. R. Geer
Speedometer....J. H. Bullard
Spool or reel for tape or the like..R. J. Riley
Springless lock....P. J. O'Brien
Steam and vacuum trap....C. D. Tillison
Steam-trap....L. M. Cooper
Steel....J. W. Evans
Stoker, Locomotive automatic..S. D. Griffith
Stone-saw, 2 pats....F. P. Hanson
Stove....F. E. Lesley
Stove, Charcoal-....A. W. Stickle
Stove or cabinet, Cooking....C. B. Adams
Stovepipe-ventilator....L. E. Hall
Strainer....J. M. Mulheir
Street-cleaning machine....J. W. Dougherty
Strength-testing machine....W. H. Johnson
Surfacing-roll....A. Bevan
Sweeping-machine....J. Cable
Switch-throw....H. M. Check
Table....J. Wallin
Talking-machine....J. B. Browning
Tank attachment, Storage and refrigerating..W. Griesser
Tantalum, Purifying....E. Weintraub
Telegraph, trolley, and like pole, Metal....J. F. Craven
Telegraphy, Directed wireless.E. Bellini et al
Telegraphy, Wireless....R. A. Fessenden
Telephone-transmitter....E. T. Evans
Telescope, Binocular....A. Konig
Thresher, Pea-....E. O. Blackwell
Threshing-machine concave....W. L. Case
Tie-plate....E. H. Bell
Tile-coating machine, 2 pats..F. E. Goldsmith
Tire-armor....C. H. Maddox
Tire for vehicles, Pneumatic....C. E. Titus
Tire-shoes, Making....F. A. Sciberling et al
Tire, Spring-....R. J. Lackner
Tobacco-stripping machine....C. F. Hall
Tool, Compound....J. H. Nantz
Tool, Pneumatic....W. H. Soley
Toy....A. I. Doerr
Toy bank....J. F. Schnaufer
Toy vehicle....J. W. Arney
Train-order catcher....L. C. Schweppe
Train-service coupling....I. B. Turner
Traveler-holders, Device for loading....J. H. Cobb et al
Traveling case and bag....S. Grossman
Trellis, Metallic....J. F. Jaquet
Truck and stand, Combined jack...H. N. Day
Truck, Dumping or unpacking....W. V. Ellis
Truck, Locomotive-....H. D. Taylor
Trucks, Swivel-plate for motor.A. Christianson
Trunk, Hat-....O. Rangnow
Trunk, Wardrobe-....O. Rangnow
Tumgling device....B. E. Sawyer
Turbine, Steam-....W. Kilmer
Type setting and casting machine.H. Degener
Type-writer line-lock mechanism....M. B. Sargent
Type-writing machine....H. L. Wagner
Type-writing machine....A. G. F. Kurowski
Type-writing machine....A. C. Smith
Type-writing machine....O. A. Martini
Type-writing machine....A. Obernolte
Umbrella-frame....L. H. Carter
Valve, Automatic shut-off....M. H. Farley
Valve, Foul-gas....O. F. Greim
Valve-gear, Engine....G. Horvath
Valve mechanism for water-elevators....J. L. Latta
Valve, Rocker-....S. N. Palms
Vaporizer for medicines....A. G. Whitehorne-Cole
Vehicle-wheel....H. E. Cherry
Vehicle-wheel....O. Schott
Vending-machine....A. B. Jones
Vessel-capping machine....J. A. Hicks
Vessel, Submarine....S. Lake
Vise....J. J. Dix et al
Vise....D. Kovacs
Vote-registering machine....D. L. Newcomb
Voting-machine....D. L. Newcomb
Wagon-bolster, Spring...J. L. and A. Hagel
Wagon-brake....P. Dickens
Wagon-brake....C. W. Page
Wagon, Dumping-....E. E. Geeseman
Washboiler attachment....W. F. Fessler
Washing-machine....W. M. Kincaid
Washing-machine....J. Schwartz
Waste and overflow trap....E. W. N. Boosey
Waste-plug mechanism for lavatories and the like....J. Allingham
Watch-holding case, 2 pats....W. E. Porter
Water-closet....J. A. Barr
Water-wheel, Submerged....W. B. Campbell
Waves, Apparatus for utilizing the movement of the sea-....A. Ravelli
Weed-destroyer....P. Hall
Weighing-machine, Automatic....A. J. Ball
Well-boring apparatus....A. A. Steel
Wheel or roller....F. S. Morton
Wheel rim or felly for pneumatic or solid tires....J. B. Bradshaw
Wheel-rim, Supplemental....J. L. Hecht
Wrench....I. J. Basken
Zinc, Manufacture of....O. Loiseau

DESIGNS.

Boxes, Paper-wing....R. Gair
Fabric....H. E. Schultz, Jr.
Light-shade....A. J. Sanford
Match-holder....I. L. Hall
Paper, Wall-....H. W. Wild
Shade-roller and curtain-pole bracket....F. F. Wright et al
Sign-plate....M. McClarence et al

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Accumulator....M. Schneider
Adders, Carrying mechanism.J. G. Kingsbury
Adding-machine....F. C. Rinsche
Aerating liquors....A. Tosco
Alarm....A. Coyne
Antimony ores, Treating.H. L. Herrenschmidt
Apparel-hanger....C. A. Vanderburg
Ash-screen....B. A. Malone
Automobile steering mechanism....R. Symmonds, Jr.
Auxiliary motor for reversing reversible internal-combustion motors....K. J. E. Hesselman
Bags, Mechanism for attaching valve-strips to....F. E. Beam
Baling-press....E. D. Smith
Baling-press....L. B. Fields
Ball-bearing lock for doors and gates....F. Ziganek
Barrel, Collapsible....O. T. Giroux
Batteries, Treating cans of alkaline storage..T. A. Edison
Bed, Combination-....W. Bubel
Bed, Sofa-....S. Karpen
Bed-spring-attaching device.W. J. Lindemeyer
Bedstead attachment....J. E. Deweese
Beehive....T. R. Runkle
Bell-hammers, Construction of...H. W. Eden
Belt attachment....E. E. Nye
Belt-hooks, Mount for....J. C. Conn
Belt-shifter....T. Allsop et al
Bicycle and motor-cycle holder..W. L. Settle

Belt-shifter and gear-stop, Combined.....T. Allsop et al
Binder, Ledger-.....W. S. Mendenhall et al
Binder, Loose-leaf.....F. G. Eichorn
Blackboard and table, Combination.....H. A. Snyder
Blowpipe.....J. Harris
Blowpipe.....O. P. Davis
Boiler-cleaning composition.....E. Vezie
Boiler explosions, Means for preventing.....J. V. Hoffmann
Boilers due to electrochemical action, Means for preventing the corrosion of the internal parts of.....P. E. G. Cumberland
Boilers, Heating-tube for tubular steam-.....E. Pielock
Boilers, Soot-ejector for water-tube.....J. J. Hanlon
Bolt cutting and pointing machine.....A. B. Landis
Bolt-cutting machine.....A. B. Landis
Bottle.....F. Blumenthal
Bottle.....J. E. Campbell
Bottle-capping machine..F. C. H. Strasburger
Bottle-capping machine.....R. B. Yerby
Bottle, Non-refillable.....G. H. Gumhel
Bottle, Non-refillable.....H. E. Walker
Bottle, Non-refillable.....J. P. Boardman
Bottle opener, Milk-.....O. T. Dougherty
Bottle-washing machine.....W. L. Bodman
Bottles or the like, Stoppering device for.....T. Heffernan et al
Box.....E. S. J. Child
Boxes, Machine for making flexible.....E. G. Staude
Brassière.....A. Benjamin
Briquet-mold.....L. H. Martens
Brush, Dusting-.....J. E. Snevely
Buckle, Baling-tie.....D. W. Bartran
Building-block.....S. H. Wightman
Building construction.....J. Kahn
Burglar-trap vault.....E. R. Eckman
Bush for tap-holes of casks, barrels, jars, or other vessels.....A. Nixon
Cable-support for terminal or junction boxes..H. H. Nicholson
Calculating device.....A. D. Burnett
Camera attachment.....G. A. Roberds
Camera, Photographic.....J. E. Thornton
Camera, Photographic.....J. Gaut
Can-body-flanging machine...E. V. Swangren
Can-body-flanging machine, Automatic.....F. Rudolphi
Can-cap-tipping machine.....C. H. Ayars
Candy-machine.....G. F. Dickson
Cane-sling.....L. D. Gregg
Capping-machine, Duplex.....G. Kirkegaard
Car-coupling, 4 pats.....J. V. Munger
Car-coupling.....J. L. Daddow
Car-fender.....C. L. and R. W. Sharp
Car, Hand-.....H. F. Dale et al
Car-haul.....H. H. Bighouse
Car-indicator.....D. Willoughby
Car-side construction.....J. G. Bower
Car signal system, Electrical-..F. S. Denneen
Car-step, Extension.....U. E. Crofut, Jr.
Cars, Bell-operating mechanism for railway-..F. J. Roche
Carbureter.....W. Shearer
Carbureter.....W. P. Kingsbury
Carbureter for combustion-engines.....R. E. Krause
Card and garment holder.....H. J. Bell
Carpenter's tool, Combined.....P. Tuomi
Carpet-beater.....J. H. Mangan
Carriage-windows, Means for opening and closing.....J. Altrichter
Cash-register.....T. Carney
Catalytic and making same.....T. J. Wrampelmeier
Cement seat.....C. P. Price
Chair attachment.....F. W. Butt
Cheese-cutter.....I. E. Lee
Cheese-stirrer.....O. H. Moldenhauer
Chopping-machine.....J. J. Kilman
Chuck.....J. B. Hall
Chuck.....T. J. Fegley
Chuck, Lathe-.....R. H. Hurlbut
Churn.....T. A. Huggins
Churn.....R. E. Coulthard
Cigar-butt former.....J. Carter
Circuit-breaker for electrically-heated devices.....W. G. Nagel
Clasp.....G. A. Larson
Clasp.....A. O. Boyland
Clock, 2 pats.....A. M. Yeakel
Clothes-drying rack.....J. R. Russell
Clothes line reel and pin box..E. T. Enerson
Clothes-rack.....R. B. Meek
Clutch mechanism.....C. L. Grohmann
Coating metals by cementation.....A. Sang
Cock, Automatic drain-.....J. G. Radick
Cock, Ball-.....G. E. Van Deusen
Coin-controlled lock.....H. E. Lane
Coke-oven door.....J. F. Peters
Collar, Sheep-.....C. P. Ballard
Collector.....A. Goedecker
Combing fibrous materials, Machine for.....F. Schmidt et al
Concrete construction, Plant for...T. Emtman
Concrete-distributing device.....A. L. Smith
Concrete fence.....E. and C. Wagler
Concrete floor construction, Reinforced.....L. Patterson
Condenser.....E. F. Rudeen
Condenser, Ammonia-.....B. Walter
Connecting-pipe, Flexible...G. W. Henry, Jr.
Controller.....F. E. Case
Controller.....A. T. Crocker
Converting apparatus...C. L. Sovereign et al
Conveyer.....D. J. Nee
Cooking outfit, Camp.....A. J. Avery
Cooking utensil.....F. Andreas et al
Cooling apparatus for provisions.L. D. Secrest
Coop, Brooding-.....A. W. Altorfer
Cop-spindle.....L. B. Laurent et al
Copper and other metals, Depositing.A. Sang
Cord or rope holder.....C. C. Sprinkle
Corn from the stalks, Machine for cutting ears of.....F. M. Widerman
Costumer.....J. C. Wilson
Cotton-chopper.....T. K. Boggs
Cotton-gin.....J. C. Boesch et al
Cotton-picking machine.....S. S. Thomas
Couch, Reclining-.....C. A. Lindner
Counter device.....F. E. Northrop
Crane, Floating.....A. Bode
Cultivating shovel, Surface-...L. B. Penton
Cultivator.....P. Johnson
Culvert.....N. S. Davis
Curtain-pole bracket.....B. Luttich
Curtain-pole, Adjustable.....C. Kirkbride
Cutter-head, 5 pats.....A. B. Landis
Cutter-head for bolt-cutting machines.....A. B. Landis
Cycle frame, Motor-.....C. L. W. Huser
Cycles, Transmission mechanism for motor-.....P. S. Bushnell
Cylinder-lubricator.....C. C. League
Cylinder-lubricator.....F. B. Hubbard
Dental casting appliance.....E. R. Stealy
Dental plugging instrument.....G. B. Snow
Deposit and collection receptacle.H. P. Turner
Derrick.....A. Forest
Dish.....M. W. Scott
Dish-stand.....N. F. Daumeyer
Display-cabinet.....V. D. Payne
Display-stand.....H. Rosenthal
Door.....T. M. Cole
Door-check.....J. A. Stuart
Door lock and switch.....E. E. Saphore
Door-opener.....J. L. McKee et al
Drag, Road-.....E. L. Carroll et al
Drawer, Furniture-.....T. C. Prouty
Drawers, Knee-.....W. D. Richey
Dredging apparatus.....W. R. Comfort
Drier.....M. Whitlatch
Drying apparatus.....D. Diver
Drying articles of jewelry, &c., Means for..A. W. Hutchins
Drilling-machine.....J. P. Barnes
Drilling-machine.....J. S. Barnes et al
Drilling-machine.....W. F. Barnes
Duplicating-machine stand.....A. Hendricks
Eaves-trough hanger.....S. T. Nakashjian
Egg-beater.....R. Washburn
Electric-cable connection....W. J. Littlehales
Electric-conductor conduit.....G. A. Lutz
Electric furnace and operating the same.....A. L. J. Queneau
Electric generation, distribution, and control, System of.....L. Lyndon
Electric generator, Dynamo-.....G. Lewis
Electric snap-switch, Four-way..W. S. Mayer
Electric switch.....D. G. Butts
Electrical distribution, Appliance for systems of.....G. A. Lutz
Electrical receptacle.....F. J. Russell
Electrode, Arc-light.....I. Ladoff
Electrode, Storage-battery.....T. A. Edison
Electrode-support, Battery.....C. B. Schoenmehl et al
Electromagnetic switch.....R. V. Collins
Eraser.....E. E. McSweeney et al
Evaporating apparatus, Multiple-effect.....S. M. Lillie
Evaporator.....J. F. Hanrahan et al
Evener-coupling.....G. F. Thompson
Excavating-machine.....C. S. Brown
Expansion-bolt.....C. B. Skidmore
Explosive.....A. Mikolajczak
Explosive-engine.....H. G. Holmes
Eyeglass-holder.....F. H. Todd
Fan, Fly-.....T. L. Thompson
Fastening.....S. A. Smith
Fence-post.....M. Gage
Fence-wire clamp.....E. J. McCain
Fences, Clamp for stretching wire.....S. W. Berry
Fifth-wheel for automobiles.J. J. Scheib et al
File for school-desks.....E. W. Lee
Filing compressor, Vertical-.....O. Haskell
Filling-machine, 2 pats.F. C. H. Strasburger
Fireproof door and the like.....J. R. Hussey
Floor-surfacing device.....P. T. Lemaster
Flour-bin.....J. S. McQuinn
Fly-trap.....G. and H. R. Laube
Folding-machine.....H. K. King
Fondant-mixing machine.....S. E. Ball
Frame-adjuster.....C. Ehr
Fruit-gatherer.....T. Branch
Fruit-gatherer.....M. C. Nickell
Fuel and making the same, Artificial.....C. F. Bonhack
Furniture.....T. C. Prouty
Furniture, Combination article of.....G. W. and G. E. Myers
Game apparatus.....D. H. Talbert et al
Game apparatus.....T. C. Luce
Garment-fastening cover.....T. Wickersham
Gas, Apparatus for making petrolized or air..W. Shearer
Gas, Apparatus for purifying blast-furnace...H. Savage
Gas burner, Alcohol-.....W. E. Cochran
Gas-burner safety attachment.....C. Liaci
Gas-engine.....D. H. Bennett
Gas-engine, Two-cycle.....J. M., A. C. and A. Johnson
Gas-furnace, Regenerative..G. H. Benjamin
Gas-log.....O. E. Hansen
Gas-regulator.....W. R. Park
Gas-supply-controlling device...H. O. Ewing
Gases, Absorbing dilute nitrous.....B. F. Halvorsen
Gassing apparatus.....J. O. McKean
Gassing-machine.....J. O. McKean
Gate.....J. W. Matthews
Gate.....H. W. Street
Gate-spring.....D. L. Clement
Gear-cutting machine.....S. Sunderland
Gearing.....J. S. Barnes
Gearing.....B. M. W. Hanson
Gearing.....H. H. Taylor
Gearing, Change-speed.....A. B. Landis
Gearing, Power-transmission...W. L. Fodrea
Governor.....J. P. Nikonow
Grading and ditching machine.....W. Hay
Grain-bucket.....J. P. Zoller
Grain, Steeping.....A. W. H. Lenders
Graphophone.....B. Morton
Greenhouse-bench.....W. Wait
Grinding-mill.....T. Cascaden, Jr.
Halter-tie.....W. J. Ruttan
Handcuff.....G. Caveney
Harrow.....J. H. Peden
Harvester, Cotton-.....W. T. Comer
Heat-insulating wall.....C. J. Coleman
Heating apparatus.....L. H. Freymuth
Heating boiler, House-.....L. S. Bush
Hinge.....W. L. Young
Hinge, Casket-lid.....F. Stanley
Hinge, Spring-.....F. Brucker et al
Hitching device.....R. D. Gordon
Hog-trough.....J. H. Barnhart
Home-plate.....W. E. Pisel
Horseshoe-calks, Machine for facing.....A. Erickson
Hoof-knife.....A. F. Kailey
Horseshoe-machine.....A. Smith
Hose-coupling.....C. F. Wilson et al
Hose-coupling.....E. H. Gold
Hose-jacket.....W. C. Shepard
Hub, Automatic spring-.....S. T. Boyd
Ice-cream-cone-holder.....J. F. Reid
Incubator.....W. H. Somersall
Incubator-alarm.....P. Flora
Inductor-generator for ignition purposes.....H. J. and T. E. Podlesák
Insect-catcher.....A. H. Lee
Insectarium.....G. A. Akerlind
Insecticide.....G. Oddo
Insulating means for flush switches.C. D. Platt
Insulator, Knob-.....S. P. Grace
Insulator, Section-.....R. S. McFeely
Internal-combustion engine.....H. A. Burt
Internal-combustion engine.....E. Moore
Iron, Double-corrugated sheet-....K. Knutson
Iron holder, Smoothing-.....E. G. Patten
Ironing-board.....I. B. Jennings
Jewel-cluster setting.....D. I. Strelitz
Journal-brass.....F. J. Finning
Keyhole-guide.....R. G. Hausdorfer et al
Kinematographic films, Apparatus for the continuous drying of perforated...E. A. Ivatts
Knife-handles, Composition of matter for.....H. C. Hart
Lace fastener, Shoe-.....C. M. Partridge
Lamp, Arc-.....M. Fortuny
Lamp socket, Electric-.....W. S. McLewee
Lamp socket, Incandescent-.....F. C. Aschenbrener
Lamp socket, Incandescent-.....R. R. Miller (Reissue)
Lathe.....Z. B. Coes
Lathe, Automatic.....J. P. Brophy
Lawn-cleaner rake, Rotary.....C. H. Mosher
Leather, Artificial.....J. J. C. Smith
Letter-box.....L. Ehrlich
Level, Spirit-.....E. Andersen
Lifting-jack.....J. E. Morse
Lifting-jack.....G. R. Booth
Lightning-arrester.....B. E. Clarkson
Link mesh, Machine for making..A. C. Pratt
Linoleum, Manufacturing.....P. Blaubach
Liquid-dispensing appliance.....I. W. Hughes
Liquid into vessels through closed chambers of filling-machines, Means for introducing..J. M. Hicks
Liquids or semiliquids, Apparatus for purifying.....N. H. Freeman
Litter-carrier.....L. T. Sehemmel et al
Locker, Metal.....R. W. Jeffris
Locking device.....F. D. Winterling
Loom for weaving, Shutteless.....E. Smith
Loom, Haircloth-.....G. S. Cox
Loom shuttle, Haircloth-.....G. S. Cox
Loom, Weft-replenishing.....H. Wyman
Magnetic separation, Apparatus for electrostatic.....H. M. Sutton et al
Mail-bag catcher and deliverer.....J. Wood
Mail-bag lock.....S. Fehnel
Mail-bag or the like lock.....C. Sismondi
Mail-marking machine.....T. G. Stoddard
Mailing-tube.....G. D. Horton
Mangle.....P. L. Brockardt
Manure-loader.....W. Roberts
Marking-gage.....W. E. Perkins
Match-box.....R. E. Jones
Match-receptacle.....H. Wark
Matrix-forming machine...G. S. Williamson
Mattress.....A. Bjornstad
Mattress-cover.....E. L. Fuller
Measuring the flow of liquids, Apparatus for.....C. J. Clark
Mechanical movement.....H. C. Gammeter
Medicaments, Preparing.....A. Meyer
Menu-cards, newspapers, and other articles, Support for.....H. P. Darche et al
Metal, Electrolytic separation of.....E. M. Chance et al
Metal, Expanded.....N. E. Clark
Milk-cooler.....J. S. McNeel, Jr.
Milking apparatus, Cow-.....F. M. Berberich
Milking-machine.....T. E. Wawrinsky et al
Milking-machine.....B. J. Bigelow
Milking-machine teat-cup...C. E. Hodge et al
Milling spirals, Machine for.B. M. W. Hanson
Miter-box.....N. G. Nelson
Mold for plastic bodies.....W. H. Crum
Molding-flask.....C. D. Smith
Molding-machine counterbalance.....E. M. Huggins
Mop-head.....E. H. Fenton
Motor-controller, Automatic.....A. E. Handy
Motor-controlling device, Electric-.....F. A. Hayes
Mouse-trap.....G. O. Terry
Mower.....C. Larson
Music-leaf turner.....P. Kohn
Music-roll for mechanical musical instruments.....H. P. Ball
Musical instrument, Self-playing.....B. L. Cartmell
Nail-making machine.....W. H. Hart et al
Napkin-holder.....H. H. Frick
Net-lifting machine, Self-clearing gill-.....J. Gierke
Net-making machine.....C. Zang
Nipple-threading mechanism.....H. W. Oster
Nut-lock.....C. J. Tomlinson
Nut-lock.....S. Harvey
Nut-lock for rail-joints.....J. J. O'Donnell
Nuts, Manufacturing thumb-....R. H. Smith
Office equipment.....F. Stevenson
Oil-burner.....W. H. Creswell
Oil-cake envelop or press-cloth.....N. W. L. Brown
Onion-pulling attachment.....F. A. Zappe
Operating-table.....E. E. Helfrich
Ore-pulp-treating apparatus.....B. MacDonald
Ores for the extraction of metals therefrom, Treatment of.....H. Rosalt
Oscillations, Apparatus for producing high-frequency.....I. Schönberg
Overshoe.....J. Smith
Oxids of nitrogen from the air, Producing.....F. I. Du Pont
Package.....J. S. Ferguson
Package.....J. H. Boye
Packing-ring.....L. E. McQuay et al
Packing, Rod-.....T. A. Johnston et al
Paddle.....J. Háry
Padlock, Pneumatic.....F. J. Gilroy
Paint and varnish remover.....M. Daxe
Paper bags or the like, Rack for.J. J. Caylor
Paper-folding machine...A. B. Collom et al
Paper or similar fabric in web form, Manipulating.....J. P. Knapp et al
Paper-weight and fan, Combined.....J. Keith
Parer and corer, Combined vegetable.A. Chase
Pasteurizing apparatus..R. M. Cauffman et al
Paving-block, Composite.....E. H. Benners
Pen, Foldable and portable stock-..W. C. Smith
Pen, Stylographic.....L. Trotzky
Pens and pencils, Retainer for fountain-.....L. D. Van Valkenburg
Penholder.....J. M. Geiger
Penholder.....R. B. Ward
Pencil.....C. von Schmnitzky
Petticoats, Flounce for.....D. J. McKenna
Phonograph.....W. H. Hoschke
Phonograph.....C. M. Hughes
Phonograph.....P. M. Ravenskilde
Photographic prints, &c., Device for use in connection with the dry mounting of.....G. W. Morgan
Piano.....T. Danquard et al
Piano, Keyless.....T. P. Brown
Picture machines, Adjusting mechanism for moving-.....W. N. Selig
Pile fabric and weaving the same.....M. J. Whittall
Pin.....F. M. Swartz
Pipe.....M. Rheinauer
Pipe, cigar-holder, &c.....J. R. Perry
Pipe coupling, Train-.....R. M. Dixon
Pipe-hanger.....A. A. Noyes
Pipe-joint-filling device.....F. J. Hatch
Pipe-threading machine.....E. A. Hoefer
Plant-support, Wire, 2 pats....O. A. Müller
Plow.....E. Rosenfeld
Plow attachment.....C. W. Eschert
Plow attachment.....L. H. McCall
Plow, Hand-.....A. R. Corrington
Plow-moldboard, Rotary.....A. Morison
Plumbing systems, Test connection for.....J. Ruhl
Pneumatic-despatch-tube system.F. H. Wolever
Polisher.....J. E. Curtis
Post-brace anchor.....C. I. Stocking
Potato cleaning and assorting machine.....J. A. Bittle
Poultry-fountain.....K. B. Martin
Powder-magazine.....J. Ervin et al
Power transmission.....J. G. P. Thomas
Printing-presses, Ribbon-cutting attachment for.....A. Livernoch
Projecting device.....W. H. Munshaw
Pulley, Driving-.....J. Mold
Pump for cleaning drain-pipes, Suction-.....L. O. Lundgren
Pump for motor-vehicles, Tire-.M. L. Bastian
Pumps or motors, Packing for rotary.....R. F. Trattner
Pumps, Water-regulator for jacketed.....W. M. Austin
Punch and die mechanism....C. A. Lindholm
Punching-machines, Automatic attachment for withdrawing punchings from..C. Scott et al
Rail-clip.....O. M. Knox
Rail, Guard-.....O. C. Simmons
Railway-coupling.....A. Lewis
Railway-tie.....H. M. Levinson
Railway-tie and rail-fastening..W. R. Gorrell
Railway-tie rod.....E. J. Bricker
Rake cleaning attachment, Hand-.W. Bullard
Range.....H. S. Marvin
Razor-blade holder.....C. W. Levalley
Razor-stropping device.....W. H. Nicholls
Record-keeping device.....A. H. Wheeler
Reeling and other textile machine, Thread-tightening device for.....J. Schweiter
Refrigerator.....F. I. Armstrong
Refrigerator.....H. Bieder
Refrigerator.....J. C. Hass et al
Rein-guide.....W. Laudon
Reversing mechanism.....G. W. Freeland
Ribbon-fastener and sales-index.....D. H. Woodman
Riveting device.....J. Tischler
Rotary engine.....W. G. Dodd
Router-bit.....C. Schroepfer
Rubber rings, Machine for cutting.....W. P. McGeouch
Rupture appliance.....J. C. Hogle et al
Sad-iron.....O. Spahr et al
Safe and vault protector.....E. Menne
Salting device, Automatic stock-.....F. and T. L. Peifer
Sand-drier.....D. M. Jackson et al
Sash-fastener.....A. Kissinger
Sash-fastener.....E. L. Brenner
Sash, Window-.....G. J. Miller
Saw gage, Crosscut-.....J. Morin
Saw-gummer.....C. A. Chandler
Scale.....N. Nilson
Screen.....R. M. Dixon
Screen.....S. C. Schofield
Screw-head turning and nicking machine.....W. Avery
Screw-lock.....J. P. Hesse
Seal-lock for receptacles.....C. H. Johnson
Sectional bolt.....E. Fongeallaz
Seed-huller, Cotton-oil-mill.J. G. Kappler et al
Separating, washing, and concentrating materials.....A. W. H. Lenders
Separating, washing, and concentrating materials, Apparatus for...A. W. H. Lenders
Sewer-mold, 2 pats.....T. E. Clark
Sewing-machine.....M. G. and A. Rosenthal
Sewing-machine embroidering or darning foot.....W. C. Ellis
Sewing-machine folding and trimming mechanism.....D. Zeiser
Shade-holder.....E. E. Brock
Shaper attachment.....L. Kramer et al
Sharpener, Cutlery-.....J. A. Wilkinson
Sharpener, Tool-.....J. Noss
Sharpening device, Lawn-mower-..C. C. Rayl
Sharpening machine, Razor-....E. A. Conway
Sheet-metal-corrugating machine..J. J. Rigby
Ship-detector.....F. S. Long
Shipping-case, Interchangeable...N. J. Busby
Shock-loader.....J. B. Schuman
Shoe.....H. McMaster
Shoe-vamp protective guard..A. J. Foley et al
Sifter.....O. G. Boggs
Sign, Illuminated.R. R. and W. K. Wiley et al
Signal system, Line.....H. D. Stroud
Signaling apparatus.....G. Hughes
Signaling system and appliances..J. G. Nolen
Silo.....R. J. and A. C. Klatt
Sintering-furnace.....G. G. Vivian
Skate, Roller-.....W. P. Dodge et al
Sled.....O. J. Mennenga

Sled-brake.....W. Nichols
Smelting apparatus.....E. Fink
Soap-dispensing machine.....R. G. Clark
Sound-records and other objects, Composition for.....J. C. English
Speed and reverse-drive mechanism, Change-.....A. C. Pletz
Spinning-machine doffer-guard.R. S. Matteson
Spool.....C. Omeliah
Spotting-machine.....H. S. Kemp
Spring-fork.....M. Schenck
Spring-support.....A. G. Bodenstein
Sprocket-wheel.....W. W. Wilson
Squeegee or window cleaner.....J. R. Lane
Stalk-cutter.....W. R. Lemons
Stalk-euteer and cart, Combined.J. T. Graves
Stamp holder, Multiple self-inking.....V. W. Boller
Staple forming and discharging mechanism, 2 pats.....V. Hoxie
Staple or clip.....F. J. Yetter
Steam-boiler.....T. Barrow
Steam-boiler, Tubular.....S. Elliott
Steel, Soaking-pit for manufacture of.....G. W. Myers et al
Stereotype-matrices, Apparatus for producing.....H. Winter
Stiffener, Garment-.....L. B. Laridon
Stool or table, Foldable.....H. J. Swarts
Stove-flue.....E. E. Thompson
Stove, Vapor-.....E. A. Gutermann
Stovepipe collar and anchor....E. E. Youtz
Stovepipe-holder.....L. A. and W. J. Shaw
Strainer.....E. V. Hax
Strainer.....J. C. McKim
Strainer, Sink-.....J. E. Cody et al
Strainer, Water-.....G. W. Collin
Strap-joint.....J. H. Skidmore
Stud or block, Antislipping.....T. Sloper
Subway.....G. W. Jackson
Sulky.....H. J. Miller
Superheater.....H. W. Jacobs
Surgical-clip applier.....A. Le Witt
Switch box or casing.....J. S. Ziegler et al
Switch-thrower, Automatic.....E. McNeil
Table having hinged leaf.....A. Hendricks
Table-leveler.....F. K. Sheppard
Tag forming and affixing machines, Tape-feeding mechanism for.....D. P. Moore
Tape-applying machine.....M. B. Diskin
Tapper, Beer-.....W. W. Frisholm
Target-trap.....W. J. Clow
Taximeter.....A. J. B. E. Darras
Telephone eall system.....W. E. Zabst
Telephone pay-station box....C. A. Anderson
Telephone transmitter, Wireless-.A. A. Jahnke
Terminal clamp.....H. F. Richter
Thread-cutting tool.....J. B. Phillips
Tile-molding machine....T. W. Costello et al
Tiles, &c., Apparatus for decorating.....D. F. Meyer et al
Time-controlling mechanism.....A. W. Bailey
Tin from tin-plate waste, Apparatus for extracting.....H. Brandenburg
Tire air-pressure gage.....W. E. Sandham
Tire, Pneumatie.....J. G. A. Kitchen et al
Tire, Pneumatic.....W. Odell
Tire-setter.....W. Schau
Tire-tightener or tire-setter.....W. Schau
Tire, Vehicle-wheel.....J. Cairns
Tires, Core for manufaeturing pneumatic.....J. K. Williams
Tobaceo-pipe.....J. R. Perry
Tool-holder.....B. M. W. Hanson
Toy, Educational.....H. B. Palmer
Track-brace.....A. J. Coover
Train-stopping and signal-aetuating mechanism.....J. F. Webb, Jr.
Transferring apparatus, Material-.....L. Callahan
Tree-protector.....T. J. McNamara
Trolley-wires and the like, Suspension device for.....G. A. Mead
Trousers-stretcher.....R. B. Liddle
Trousers stretcher and presser....W. V. Lane
Truek, Casket-.....J. Pfeifer
Truck, Hand-.....J. Buckley
Trunk.....I. S. Kallis et al
Truss, Hernial, 3 pats.....J. W. Bunker
Tubes, Manufacture of.....M. Peters
Tug, Thill-.....W. J. Campbell
Turbine.....G. A. Boddy
Turn-table.....H. R. Stickney
Twine-eutter.....H. I. Mattson
Type-casting machine.....W. N. Clements
Type-writer.....B. L. Cary, (now by marriage B. L. Bloodworth)
Type-writer escapement mechanism.F. S. Rose
Type-writing machine.....H. S. McCormack
Type-writing machine.....A. W. Steiger
Type-writing machine.J. C. McLaughlin et al
Type-writing machine.....J. C. McLaughlin
Type-writing machine.....A. M. Stone
Type-writing machine.....E. B. Hess
Type-writing machine, 2 pats.....E. B. Hess
Type-writing-machine supporting-frame.....C. D. Rice
Undercutter-support.....W. J. Whitworth
Unicycle.....A. G. Jackulvis
Valve.....G. B. Kennington
Valve.....C. W. A. Koelkebeck
Valve and operating means therefor, Ball-cock.....S. G. Neal et al
Valve attachment, Flush-.....W. F. Geiger
Valve clean-out, Boiler-check-....J. R. Martin
Valve for blending hot and eold fluids.....S. G. Neal
Valve, Gate-.....A. Watson
Valve-gear.....J. Irving
Valve mechanism, Air-operated electrically-controlled, 2 pats.....J. F. Webb, Jr.
Valve mechanism for air-brake and train-stopping systems, Air-operated electrically-controlled.....J. F. Webb, Jr.
Valve mecbanism, Non-return-...C. E. Golden
Valve, Pneumatic safety-.....F. Moyle
Valve, Universal-controlling..W. C. Arp et al
Vaporizing and mixing device...C. F. Preston
Vehicle-brake, Automatic.....G. W. Fisher
Vehicle-driving mechanism.....J. F. Waite
Vehicle, Motor-.....R. Fuller
Vehicle, Motor-.....G. W. Perry, Jr.
Vehicle-washer.....E. Muller
Vehicle-wheel.....E. S. Williamson
Vehicles, Elastic Suspension for.....L. Basso
Vending apparatus.....A. H. Arnold
Vending-machine.....J. H. Carroll
Vending-machine.....W. Asbury
Ventilating system.....A. S. Johnson
Vessel-closure.....J. C. Schleicher
Voting mechanism.....M. A. Dees
Wagon, Dump-.....W. A. Underhill
Wagon-seat lock.....V. W. Heydlauff
Washboard.....G. F. Ullrich et al
Washboard-clamp.....J. E. Terhune
Washboiler.....S. C. Logan
Washer.....J. B. Vannoy
Watch-regulator.....W. E. Porter
Water-closet seat, Auxiliary....J. G. Steffee
Water-closet, &c., tank, 2 pats...G. H. Bailey
Water-gage guard.....D. Buissono
Water-motor.....L. L. Dodds
Water-motor, Current.....H. B. Fenner
Water-purifying apparatus.....J. P. Lajoie
Water-purifying apparatus, Automatic circuit-controller for.....H. B. Hartman
Water-supply, Automatic device for controlling.....J. A. Anderson
Water-wheel.....F. Bangerter
Web-manipulating mechanism.J. P. Knapp et al
Welding apparatus.....E. G. Budd
Welding brazing, or soldering, Electric.....O. Kjellberg
Well-cover.....B. D. Hunting
Well-drilling machine.....G. D. Loomis
Wheel.....T. Berntson
Wheel.....R. R. Sandham
Wheel drive, Magnetic traction-.....C. Scott
Wheel-rim, Removable.....J. C. Cole
Whiffletree-hook.....J. M. Tappan
Whiffletree-hook.....P. H. Skavlen
Whip-socket.....W. H. Goldenstein et al
Winding machine, Yarn-.....H. S. Golland
Window.....H. J. Davison
Window-cleaner.....J. R. Lane
Window-cleaner.....H. L. Bailey
Window-pane fastener.....W. G. Kueter
Window-screen.....L. I. Brighton
Window ventilation.....J. J. Best
Window-evntilator and storm-shield.....R. A. Dunlap
Wire, Means for applying coverings to.....J. A. Heany
Wood in salt water, Protecting.....C. P. Tatro et al
Wrench.....F. Knobel
Wrench.....L. L. Barrick
Wrench.....C. Wittman
Writing-machine.....E. B. Hess
Zinc from zinciferous materials, Obtaining...H. Pape

DESIGNS.

Badge or similar article.....J. T. Bailey
Bottle.....N. H. Patno
Box.....A. Müller
Braid.....F. Doebeli
Clock-frame.....J. W. Holloway
Glass goblet or similar article.....C. O. Northwood
Lamp shade and reflector.....J. Kappler
Piano casing, Player-.....S. W. Wirts
Plate or similar article.....C. Kuhnl
Spoon or fork.....A. C. Miller
Stove.....J. Becvar

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MECHANICAL PATENTS.

Abrading-cylinder.....J. R. Thomas
Adding-machine.....J. G. Vincent
Advertising device.....L. P. Perew et al
Air and gas engine.....B. M. Aslakson
Air-compressor, Rotary.....F. Peck
Air-current governor.....S. P. Smith
Ammunition for selective shooting...H. Dorn
Amusement device.....R. Farrell
Anesthetic, Local.....N. Sulzberger
Antiphase reversing device.....W. N. Dickinson, Jr.
Antiskidding device.....J. F. Cooper
Arch-support, Disjointable and adjustable.....W. Schmidt
Ash-receptacle.....O. Partenheimer
Astronomical apparatus.....G. J. Baker
Autographic register.....Schirmer et al
Automatic cleaner and polisher.....F. H. Farrington
Automobile.....J. E. Gable
Automobile-signal.....J. T. Johnson
Axle, Driving-.....R. H. Gilbert
Axle-lubricator.....L. L. Arnold
Bag filling and closing machine.....J. N. Crowley
Balance-wheel and staff-fastener.....J. W. Cahill
Baling-prees.....R. C. Caughey
Baling-prees.....W. G. Merrall
Baling-prees.....W. W. McCallum
Barrel.....J. Wollar
Barrel, Knockdown.....G. K. Stitzer
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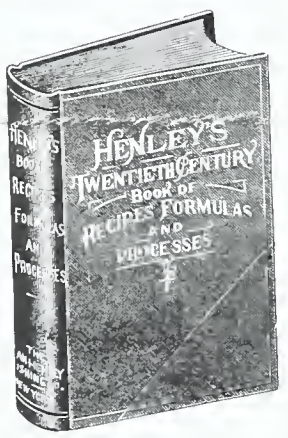

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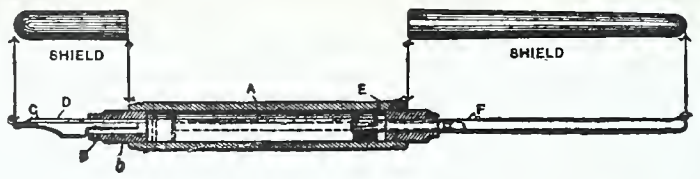

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DIRIGIBLE BALLOONS AND WIRELESS TELEPHONY IN ITALY.

By FRANK C. PERKINS.

SOME interesting and successful experiments in aerial navigation have been undertaken in Italy with a view to their use in the army. The military dirigible balloon which made its first trip from Braccian to Rome, is shown in the accompanying illustration, passing over Lake Bracckano.

The possibility of communicating between dirigible balloons and military stations and war ships by wireless has received considerable attention in that country. As Italy led in experiments in wireless telegraphy, through the work of Marconi, it may be of interest to record the tests in wireless telephony made at Rome, by Professor Q. Majorana, director of the L'Institut Superieur Postal Telegraphique. His experiments in Radio-Telephony have been most successful, and the electrical equipment at his station is shown in the accompanying illustration (Fig. 2). Telephone communication over distances of 400 miles has been carried on by Professor Majorana, who holds that for practical working two fundamental conditions are necessary: the generation of undamped, continuous electrical oscillations, and the use of an extremely powerful transmitter, carrying heavy currents and considerable difference of potential.

Three wireless telephone stations on the Majorana system are proposed, one at Palermo, Sicily, another at Cagliari, Sardinia, and a third at Naples. Some most satisfactory experiments were made in the earthquake district between Messina in Sicily, and Monte-Mario, a distance of 400 miles, and between the latter place and Trappani in Sicily. Experiments were also made between Monte-Mario and a torpedo boat on the Mediterranean.

The telephonic communication, it is maintained, was perfect in the above test, the voice being heard so clearly that it was possible to recognize the person speaking, even at a slight distance from the telephone receiver. This was over a distance of 70 miles. The conversation was also distinct over a distance of 200 miles. This transmitter of Majorana's has been tried upon wire lines over 2000 miles in length, or the equivalent of the distance from London to Rome.

Majorana first employed a rotating oscillator consisting of a motor, upon the axle of which was fixed a disc of ebonite which carried upon its opposite faces two rings of metal. Two metal brushes rested upon these rings and connected with the discharge circuit. Two of the metal rings were attached to two steel wires, 70 centimeters long and 2 millimeters in diameter, their extremities being placed together and forming a spark gap.

To the secondary of a static transformer were connected two wires of the oscillator, the primary winding carrying an alternating current from an electric light circuit. The two wires of the oscillator turned with the rotating motor, the sparks passing across the gap being subjected to violent air pressure so that each was separated and broken up into a large number of discharges, these supplying an interrupted series of sparks. For the modulation of the same to correspond with spoken words, a transmitter was designed by Professor Majorana, which has produced wonderful results not only in wireless telephony but also in ordinary telephone service. This so-called hydraulic Italian transmitter takes the place of the ordinary granular carbon transmitter, which is not at all suited to the requirements of wireless telephony on account of its low electrical resistance and its inability to carry the heavy current and high voltages usually employed for producing electro magnetic waves.

This hydraulic transmitter was designed so as not to heat the current, and to be capable of working under variations of electrical pressure. It was based on the capilliary properties of liquid jets, and consisted of a small tube of glass, from the opening of which was projected a jet of acidulated water,

FIG. 1.—THE FIRST ITALIAN MILITARY DIRIGIBLE OVER BRACCKANO LAKE.

FIG. 2.—RECEIVING A PHONOGRAMM OR WIRELESS TELEPHONE MESSAGE.

uader a pressure carefully regulated. The small tube is so fixed to the diaphragm of the transmitter that it can follow the vibration without difficulty, the liquid jet falling between two platinum electrodes and forming an electrical liquid connection between them, tbus giving the characteristic resistance of the transmitter. The variations of this resistance determine the transmission of the words as the person speaks before the transmitter diaphragm, which vibrates in the same manner as the ordinary telephone transmitter. The variations in the resistance of the liquid interposed between the two electrodes of platinum is caused by the little tube vibrating witb the diaphragm and forming contractions in the liquid jet, these fluctuations of resistance being in perfect accordance with the sounds causing them. This hydraulic transmitter, when connected with tbe rotating oscillator, produced variations in the intensity of the discharges, corresponding with the sounds applied to tbe transmitter. More than two years ago Professor Majorana was able to reproduce the voice at long distances and to receive speech clearly by the use of the ordinary receiver of wireless telegraphs.

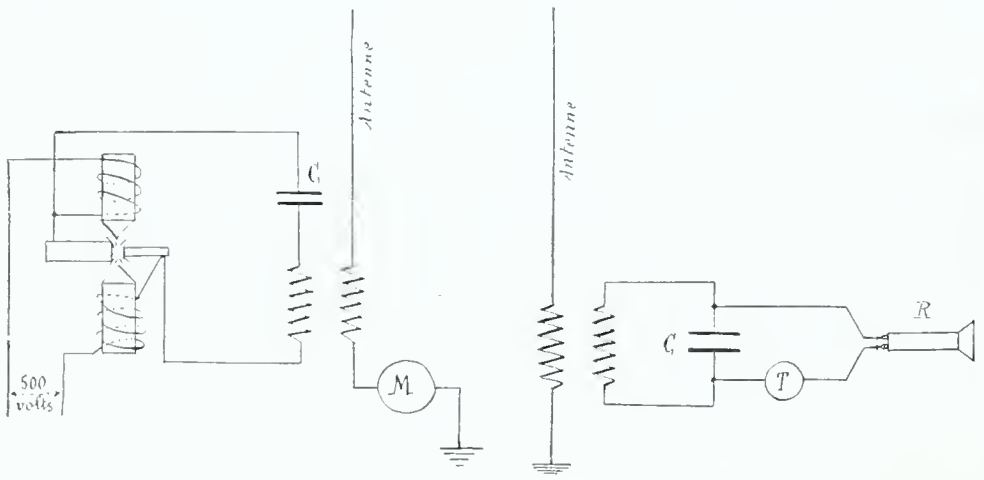

FIG. 3.—TRANSMITTER AND RECEIVER OF WIRELESS TELEPHONE SYSTEM.

The Poulsen discovery of producing undamped electro-magnetic waves in an uninterrupted train caused Professor Majorana to discard tbe rotating oscillator and adopt similar apparatus, consisting of a voltaic arc burning in an atmosphere of hydrogen. Poulsen was able to increase both the intensity and the frequency of waves, the arc producing alternating currents of a frequency varying from a quarter of a million to a million vibrations per second, and the currents being of considerable intensity. Two electro magnets fed by the same current as the arc, created the transverse magnetic field, and these magnets maintained the position of the arc with reference to the electrodes and rendered the production of the waves more constant and more efficient as well.

Majorana has applied this generator of uninterrupted waves to his system of wireless telephony, as indicated in Fig. 3. In the transmitting station the arc is enclosed in an atmosphere between one electrode of copper and another electrode of carbon, the oscillatory circuit containing the capacity and the primary winding of a transformer of tbe Tesla type. The antenna is connected to one terminal of the secondary of this transformer, the other terminal being connected to the hydraulic transmitter which is in turn connected with the ground.

The Majorana receiving station is equipped with another oscillatory circuit, with antenna and a thermo electric detector composed of two metals in contact, whicb under the influence of the waves are warmed to a greater or less degree, thus producing modification of current corresponding with the electric waves and therefore with the voice of the person speaking at the transmitter station. In the telephone receiver these variations of current are reproduced and it is stated a special syntonization system has been designed, which gives perfect attunement of the receiving and transmitting equipment for very distinct communication.

The diagram Fig. 3, shows tbe arrangement of the 500 volt circuit of tbe transmitting station with tbe arc antenna and a bydraulic transmitter. In the diagram of the receiving station will be noted tbe electric detector key in the circuit with the receiver R and capacity C. The Majorana receiving apparatus was designed because tbe magnetic and electrolytic detectors first tried were found to be poorly adapted to the reception of the Poulsen waves which were employed.

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RECORDING DRAUGHT GAUGE.

An instrument has been devised for recording the suction of a chimney or flue, measured in inches of water. A lead pipe connected to the chimney is joined to the recorder by means of a union coupling, communication being thus established between the chimney and the inside of a metal bell (numbered K in illustration) whose mouth is sealed by being dipped into oil contained in an outer vessel H. The stronger the suction of tbe chimney, the more the bell is depressed. The bell is suspended from one end of a balance beam L, the other end of wbich experiences a downward pull from a helical spring M. A pointer A is carried downward from the axis of the balance beam, and its lower extremity moves to left or right according as the chimney-suction becomes greater or less.

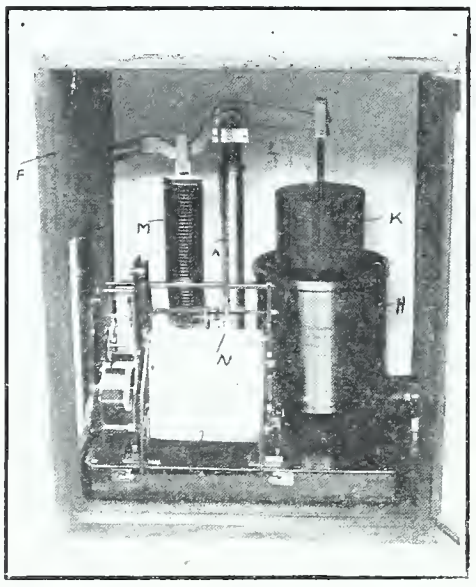


FIG. 1.—RECORDING DRAUGHT GAUGE.

This lower extremity of the pointer serves to carry the recording pen N, which is thus caused to move transversely across a long sheet of recording paper O, in response to the variations of the suction. By an ingenious arrangement, the pen is caused to travel to and fro in a straight line, and would in fact describe a straight line upon the paper if the latter were kept still instead of being regularly moved forward by a clock.

The movement of the pen across the paper is rather more than one inch for a cbange of one inch head of water in the chimney suction; the range of variation provided for is three inches head of water, and the instrument is readily modified so that the actual values of suction which can be recorded extend from zero to tbree inches, or from $\frac{1}{2}$ inch to $3\frac{1}{2}$ inches, or from 1 inch to 4 inches. Weights are supplied when ordered, suitable for attachment at the forked end F of the beam so as to raise the scale of suction values by either half an inch or one inch head of water.

Tbe paper used for recording is ruled with lines corresponding to every tenth of an inch head of water and with a transverse set of lines corresponding to every quarter of an hour of time. The paper is supplied in continuous rolls, each containing enough for at least a fortnight's continuous work. The clockwork movements used for feeding the paper are capable of running for a fortnight, so that the recorder will work for tbis length of time without attention.

The record is at all times open for inspection through the glass door of the recorder case. When tbe roll of recording paper has to be changed, the door of the case is opened, which serves to apply a brake to tbe front spool B. This spool takes up the paper as it passes from under the recording pen, and is actuated by clockwork. The object of the brake is to prevent the front spool racing when no longer restrained by the recording paper. The recording pen N is gently lifted from its bearings in the end of the pointer, and laid to one side. The ebonite presser-wheel, which keeps the recording paper in contact with the milled driving disc E^2, is raised clear of the paper by means of the lever C^1 which should be lifted bigh enough to engage in the top notcb of the slot C^2. The two spools B, D, are released by screwing inward the two small milled-head screws B^2 and D^2, so as to withdraw the two little plungers B^3, D^3, in whose inner ends the spool-spindles are journaled. Tbe finished record

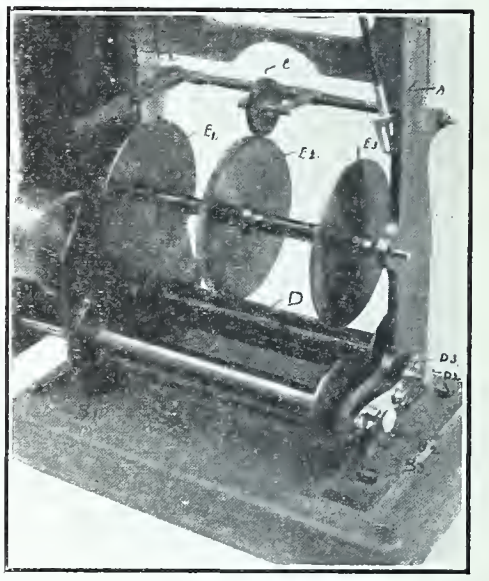


FIG. 2.—DETAIL VIEW OF MECHANISM.

can now be readily removed from the spools. The back spool D has one flange secured to it by means of screw-heads working in keyhole slots, so as to be readily removable. This flange removed, the new roll of paper is slipped on to the spool, and tbe flange securely replaced. The back spool D carrying the roll of paper, is brought into position in the frame, and by screwing out the milled-head screw D^2, the little plunger which forms one bearing for the back spool spindle is allowed to return to its normal position, supporting the back spool D. The free end of the recording paper is led over the discs E^1 E^2 E^3 and secured to the front spool B ready for winding. Tbe pool B is fitted with an incomplete sleeve with limited rotational freedom, thus enabling the free end of the paper to be readily secured. The front B is brought into position in the frame, and secured precisely as was the back spool. Both clock-movements are then wound and

the pendulum clock set going. The back spool D is turned by hand so that the paper becomes taut over the the driving disc E^2. The recording pen is placed in position, with its point directed towards the left. The front spool B is then turned so as to wind up some of the paper until the pen is correctly pointed to time. The lever C^1 which controls the presser-wheel C, is lowered and locked in the lower notch, which keeps the presser-wheel well up to its work. Both doors of the recorder are closed, the front one automatically tripping the brake B^1, which up to now has been checking the rotation of the front spool B. This is the routine operation of changing the recording paper, as noted, and has to be performed about once a fortnight.

Forest Products Laboratory Ready for Work.

An event of importance to the wood-using industries of the country and to engineers is the completion of the Forest Products Laboratory at Madison, Wis. June 4 has been set as the date for the formal opening. The laboratory has been established to aid, through experiments and demonstrations, the lessening of waste in the manufacture and use of wood. It is a co-operative undertaking between the U. S. Department of Agriculture and the University of Wisconsin. The State has errected for the purpose a new huilding at the university and will furnish the light, heat, and power. The Department of Agriculture has supplied the equipment and apparatus and will maintain the force of thirty-five or forty persons required to carry on the work. Through this arrangement, the United States has secured perhaps the largest and hest equipped wood testing lahoratory in the world.

The laboratory will be prepared to make tests on the strength and other properties of wood, to investigate the processes of treating timher to prevent destruction by decay and other causes, to study the saving of wood refuse by distillation processes, to examine the fiber of various woods for paper and other purposes, and to determine the influence of the microscopic structure of wood on its characteristics and properties. Facilities are at hand, in fact, for almost any kind of test on wood that practical conditions may require.

Lumber manufacturing and wood-using industries are keenly interested in the work on account of its practical bearing on reducing waste of wood—to them a subject of vital concern. Already they have proposed many experiments and supplied much testing material, which is awaiting attention.

Many prominent men of the lumbering and wood-using industries have signified their intention to attend on the day of the opening. Several organizationsexpect to hold directors' meetings or conferences at that time to consider, among other matters, plans for making wide practical use of the laboratory. A short, appropriate general program will he arranged, and there will be a systematic inspection of the laboratory, with demonstration work in progress at the time. The entire exercises will occupy but one day, and visitors will be ahle to return to Chicago the same evening.

APPEALS IN THE PATENT OFFICE.

In our last month's issue we commented upon the bill now pending before Congress (H. R. 18885) to create a tribunal in the Patent Office composed of the three members of the present Board of Examiners in Chief, the Commissioner, and the two Assistant Commissioners. We voiced our disapproval of the main provisions of the bill, and stated that attorneys and inventors were opposing it, and we urged our readers to use what influence they could command to defeat it. Another weapon against the hill is offered in the recent introduction into Congress of a second measure, which in our opinion and that of the patent law association of this city, more fully covers the needs of patent legislation along this line than the former one. The hill in question is known as H. R. 23916, and was introduced by Congressman Tyrrell. It amends sections 482 and 4910 as follows:

> "Sec. 482. The examiners in chief shall be persons of competent legal knowledge and scientific ability, whose duty it shall be, on the written petition of the appellant, to revise and determine upon the validity of the adverse decisions of examiners upon applications for patents, and for reissues of patents, and in interference cases; and when required by the commissioner they shall hear and report upon claims for extensions, and perform such other light duties as he may assign them.
>
> "The decisions of the examiners in chief shall, in interference cases, be final in the Patent Office, and, for purposes of appeal to the court of appeals of the District of Columbia, shall be regarded as the decisions of the Commissioner of Patents, and said court is hereby empowered to entertain and determine said appeals. In case of the disability, death, or absence of any examiner in chief, the Commissioner of Patents may designate a primary examiner to act as examiner in chief until the disability ceases or a successor is appointed."
>
> "Sec. 4910. If such party, except a party to an interference, is dissatisfied with the decision of the examiners in chief, he may, on payment of the fee prescrihed, appeal to the commissioner in person."

This bill eliminates the appeal to the Commissioner in interference cases and compels any dissatisfied claimant for a patent for an invention, in which the question of priority is involved, to carry the matter direct from the Board of Examiners in Chief to the Court of Appeals of the District of Columbia. This is as it should be, and the passage of this bill will add dignity and weight to the decisions of the Board of Appeals, and will avoid the anomalous condition of appealing from a tribunal of three members to a single official, and one so engrossed with the affairs of the administration of the Office, that the actual work of investigating the merits of the matter has to be turned over to his law clerk. In *ex parte* cases, where the patentability of an invention is to he passed upon, the appeal from the Board of Examiners in Chief to the Commissioner is still left open. We are advised that of the 782 *ex parte* appeals that were considered by the Board of Examiners in Chief last year, only 99 went to the Commissioner, whereas in interference cases, of the 220 appeals considered by the Board, 127 went up for consideration hy the Commissioner.

Ex parte cases are those in which the patentability of a claim in an application is involved, as where an examiner rejects a claim on the ground that it is anticipated by a prior patent, or as an aggregation, or for some other reason, and the applicant through his attorney takes the appeal to the Board to determine whether or not the examiner's action is correct. It is in this class of cases that the right of appeal to the Commissioner in person is left open to an applicant by the Tyrrell bili. But in interference matters, as where there is a contest between two or more applicants for patent over priority of invention, the decision of the Board of Examiners-in-Chief shall be final, so far as the Patent Office is concerned, with the right of appeal to the Court of Appeals of the District of Columbia. In these latter cases, more than in the *ex parte* cases, it has been felt that it was unfair to the applicant, as well as to the Board of Appeals, to have the decisions of the latter reviewed—as in most cases they were—by a law clerk who was inferior in position and experience to the members of that tribunal. It is at present customary, in hearings before the Commissioner, to have the law clerk hear the arguments, examine the papers and reach a conclusion, which he reports to his superior officer. This is made the basis of the Commissioner's decision.

We think the Tyrrell bill will relieve the present congestion of appeals in the Patent Office. It will adjust conditions of work much better than the bill first introduced, which has been made the subject of much adverse criticism. One particular point of the new bill is the authority it gives the Commissioner to designate a primary examiner to act as an examiner in chief, in cases of death, disability or absence of one of the latter. At present, when an examiner in chief is sick, or on leave, or—as has sometime been the case—is detailed for other work, the Board is hampered, the two members being compelled to do the work which it requires the time of all three to perform properly. By assigning a principal examiner for this duty, the Commissioner would be given an opportunity to find out the qualifications of the various examiners for permanent positions on the Board, and as vacancies there are nearly always filled by the promotion of an examiner who has shown that he has the requisite technical knowledge and legal attainments for the position. such assignments would be of great value as an aid in making selections for permanent appointment. It would enable, for at least three months. different examiners to show their fitness for the work, and would give a new incentive to the members of the examining corps to qualify themselves for this promotion, or even for the honor of a temporary seat on the tribunal, by a showing of efficiency in the performance of their ordinary duties.

The elimination from the yearly work of the Commissioner and his two assistants of 127 interference cases, more or less, which always take a great deal of time, will relieve his office of the burden of work of which he has complained, and enable the remaining work to be done with care and deliberation, and with due regard to the interests of inventors. We know it will be said that the passage of the Tyrrell bill would make the Commissioner a mere figure head, and reduce his functions to those of an office boy; but we cannot lose sight of the fact that other Commissioners have favored just such a plan, and have urged Congress to divorce from the head of the Office all judicial duties, so that he might have a better opportunity to attend to his executive work. Nor would it seem that it would greatly diminish his dignity to relieve him of the present necessity of merely transcribing the opinions of his law clerk. As an antidote to the bill, H. R. 18885, we prescribe this new bill, 23916, and urge those interested to help the passage of the latter.

Tea from Pills.

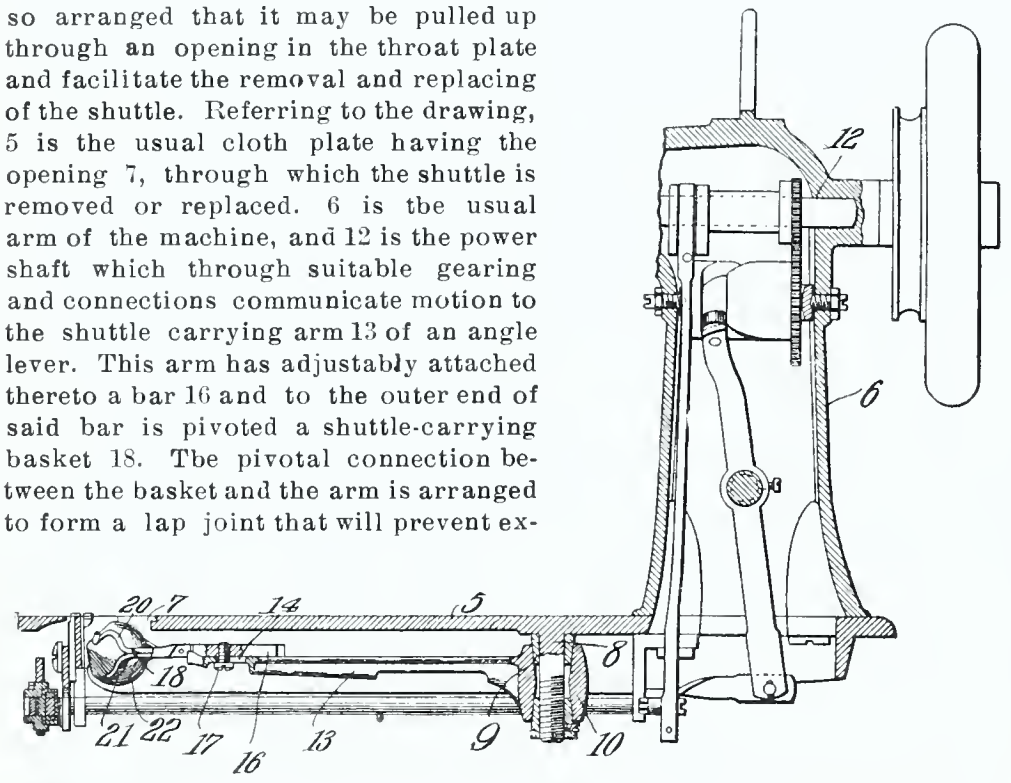
Travelers beyond the bounds of civilization, soldiers in the field, and those who go down to the sea in ships appreciate the advantages of easily portable foods. Tea tabloids are the latest in this line to win popularity. They consist of compressed tea, and were invented by a merchant in the country where, next to the great East where the plant grows, tea is the most universally consumed—England. The pills or tabloids are as big around as the end of one's little finger, and one will make a full cup. They are composed of real tea, compressed by an enormous force into pills. Each tabloid is as hard as a stone until the water touches it, when it dissolves to a powder and gives forth a delicious aroma. The pills are put up in tin boxes, and they are so small that you can carry enough for a hundred cups in your pocket. A little box of sweetening goes with them, composed of saxin—the latest form of saccharine—a material which is 600 times sweeter than sugar. This is also compressed, the pills heing only about the size of the head of a pin, but each holding enough to sweeten a cup of tea. With an alcohol lamp, and some water or melted snow, the traveler can have as delicious a heverage as in his own home.

CLEVER NEW PATENTS.

SHUTTLE MECHANISM FOR SEWING MACHINES.—COMBINATION PADLOCK.

Shuttle Mechanism for Sewing Machines.

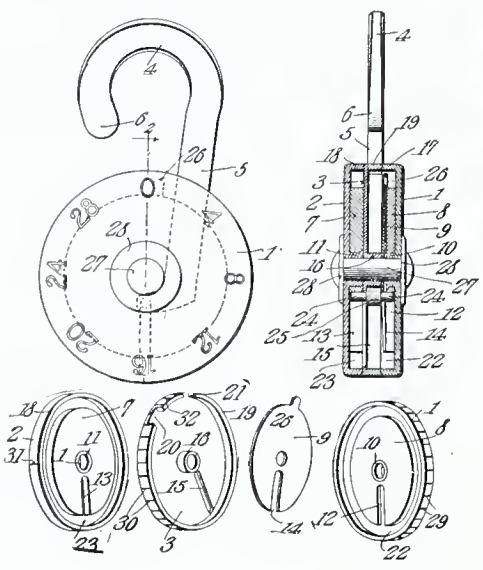
One might naturally suppose that the sewing machine had reached perfection, and that no improvement could be made, or indeed was needed, in this class of apparatus. But sewing macbines as well as all others change with the times, and while each change is not radical in itself, the aggregate result is the creation of a new type of machine. Charles F. Goforth and Marhall T. Gofortb, of Wichita, Kansas, have devised an improvement in this line which is worthy of special attention. Their object was to provide an improved shuttle support or basket, so arranged that it may be pulled up through an opening in the throat plate and facilitate the removal and replacing of the shuttle. Referring to the drawing, 5 is the usual cloth plate having the opening 7, through which the shuttle is removed or replaced. 6 is tbe usual arm of the machine, and 12 is the power shaft which through suitable gearing and connections communicate motion to the shuttle carrying arm 13 of an angle lever. This arm has adjustably attached thereto a bar 16 and to the outer end of said bar is pivoted a shuttle-carrying basket 18. Tbe pivotal connection between the basket and the arm is arranged to form a lap joint that will prevent excessive dowaward movement, and at the same time permit the basket to be pulled up tbrough the opening 7 so as to expose and permit the removal of the shuttle.



A device of this character can be attached to any sewing machine, and will facilitate the operation of threading the shuttle. The attachment is simple and inexpensive and will add much to any macbine to whicb it may be applied.

Combination Padlock.

A padlock, the combination of which can be changed without taking the apparatus to pieces, and in which the mechanism is at all times fully concealed, so as to prevent its being tampered with, has recently been invented by Luke L. Kellogg, of Fredonia, N. Y. As will be seen from the cuts (the two larger ones showing a side elevation and a vertical transverse section of the lock, and the smaller ones detail views of different parts) the lock embodies shell members 1 and 2, a shackle 4 in a guide 3, two relatively fixed flat tumblers 7 and 8, and a loose dished tumbler 9, all three being of the same diameter and so spaced from tbe shell and guide as to provide annular channels 22 and 23 for the locking pin 24 of the shackle. The pin also limits the rotation of the loose tumbler by co-action with a finger 26 on the periphery thereof. Each of the three tumblers has an open-sided radial slot, and the guide has a similar closed slot to register with the other slots when the tumblers are in position to release the shackle, as shown in the drawing. Hollow studs frictionally unite tbe tumblers with the shell members. The front sbell bears numerals, ranging from zero to 28 in stepsof four, and the rim is provided with notcbes co-acting with similar indices on the shackle guide, while the rim of the back shell has a single index 31, co-acting with the indices of the front shell and the guide.



To change the combination, tbe shackle is moved to unlocked position when the tumblers are positively held against movement. The front shell is now turned to bring zero opposite the index 32 between the guides 20 and 21, in the guide rim, which changes the combination of the front shell members to zero and 16, these being diametrically alined. The back shell is now turned to bring the index 31 into alinement with the index on the front shell indicating 10, which sets the combination. When the shackle is pushed in, and the shell members turned, the combination is broken. To unlock, turn the front shell twice to the left and stop at 16 opposite the index 32 on the guide rim. This turns the loose tumbler and brings its finger 26 into engagement with the tumbler locking pin, which holds it against further movement. The front shell is now turned to the right half a rotation, to bring zero opposite the index 32, and the back shell turned to bring index 31 opposite 10 on the front, wbich will bring all the tumbler slots into register, and allow the shackle to be withdrawn.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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WAYNE MFG. CO. v. BENBOW-BRAMMER MFG. CO.

(Circuit Court of Appeals, Eighth Circuit. March. 6, 1909. 168 F. R. p. 271.)

1. PATENTS—CLAIM 1 OF PATENT NO. 535,465 TO SCHROEDER FOR MEANS FOR OPERATING WASHING MACHINES SUSTAINED.

Claim 1 of letters patent No. 535,465, issued to John Schroeder, for means for operating washing machines, March 12, 1895, was not anticipated by figure 371 of Brown's "507 Mechanical Movements," nor by British letters patent No. 2,940, February, 1876, nor by letters patent No. 304,549, issued Sept. 2, 1884, to Frank L. Palmer, and it is valid.

2. PATENTS—IN OLD CROWDED ART EACH INVENTOR ENTITLED TO HIS OWN IMPROVEMENT.

Where an art is old and crowded so that no pioneer patent exists, and many inventors conceive and construct machines, combinations, and improvements therein which accomplish the desideratum with varying degrees of success, each inventer is entitled to his own machine, combination or improvement, so long as it differs from those of his competitors and does not include theirs

3. PATENTS—APPLICATION TO NEW USE—WHEN INVENTION AND PATENTABLE—WHEN NOT.

The application of an old machine, combination, or device, fonnd in an analogous art, without substantial modification, to a new use, is not invention nor patentable, where its applicability would occur to a person of ordinary mechanical skill.

But such an application is invention and patentable where its applicability would not be perceived by a person of ordinary mechanical skill, where it is incapable of performing the function requisite to the new use without substantial modification, and where it was not designed by its maker, nor adapted, nor actually used, to perform such a function.

4. PATENTS — INFRINGEMENT—CHANGES IN FORM WILL NOT ESCAPE.

Changes in the form of a machine or combination secured by patent will not avoid infringement, where the principle of the invention is taken, uuless the form is the distinguishing characteristic of the invention.

The substitution for two rows of teeth, which mesh around and engage with the cogs of a pinion in a patented device, of a single row of two-faced teeth which performs the same function in the same way, will not avoid infringement.

5. PATENTS — CLAIM—LIMITATION BY REJECTION AND AMENDMENT.

A patentee who acquiesces in the rejection of his claim on references is estopped from maintaining that an amended claim covers the combinations and devices shown in those references, or that it has the breadth of the rejected claim.

But he is not estopped from claiming and securing by an amended claim every improvement and combination he has inveuted that was not disclosed by the references upon which his original claim was rejected.

WILLIAM MANN CO. v. KALAMAZOO LOOSE LEAF BINDER CO. et al.

(Circuit Court, S. D. New York. March 3, 1909. 168 F. R. p. 284.)

PATENTS — INFRINGEMENT — TEMPORARY BINDER.

The Leslie patent No. 603,428, for a temporary binder, consisting of two back pieces, a cord counecting them and passing through one, and means for shortening such cord so as to bring the back pieces together uniformly, is for an improvement on the prior art, and the combination as a whole discloses patentable invention; but the patent is entitled to only a narrow construction, and is limited to the precise device shown and described. As so construed, held not infringed.

SHARP v. BELLINGER et al.

(Circuit Court, N D. New York. March 5, 1909. 168 F. R. p. 295.)

1. PATENTS — CONSTRUCTION — LIMITATION BY LANGUAGE OF CLAIMS.

Courts will go far to save a patent for a meritorious invention, but they cannot reconstruct claims and disregard their very terms, and add or substitute material words not found thereiu, but necessary if the true invention is to be covered.

2. PATENTS—CONSTRUCTION-IMPROVEMENT PATENT.

When the inventiou of a patent is not a pioneer invention, the iuventor is held to a rigid construction of his claims, and is not entitled to any considerable range of equivalents; and when, in a patent for a mere improvement, which in view of the prior art is extremely narrow, he has limited his claims by specific words to a specific form of device or element, he is bound thereby.

3. PATENTS — INVENTION AND INFRINGEMENT—FIRE-ESCAPE.

The Sharp patent No. 835,985, for a fire-escape, consisting of a stationary frame carrying a reel upon which is wound a cable by meaus of which a person may lower himself to the ground, the movement of the cable being controlled by brake-shoes, discloses patentable invention in the manner and means of applying the brake-shoes, but is only for an improvement, and the claims must be limited according to the precise means shown and described. As so construed, the patent is not infringed by the Davy patent No 818,526.

BALL v. COKER et al.

(Circuit Court, D. South Carolina. Feb. 24, 1909. 168 F. R. p. 304.)

1. PATENTS—NATURE OF PATENT RIGHTS.

The right to a patent monopoly exists only by virtue of the laws of the United States, and cannot be affected by state laws.

2. PATENTS — TRANSFER — REQUISITES ON VALIDITY.

A patent monopoly can only be transferred in the manner prescribed by Rev. St. § 4898 (U. S. Comp. St. 1901, p 3387), namely, by a written instrument signed by the owner of the patent and duly recorded.

3. EXECUTION—PROPERTY SUBJECT — PATENT RIGHTS.

A patent right cannot be sold on execution.

4. RECEIVERS—TITLE TO PROPERTY — PATENT RIGHTS.

A patent right does not pass to a general assignee or receiver of property of the owner.

5. PATENTS — SUIT FOR INFRINGEMENT — TITLE TO SUPPORT—RECEIVER.

The mere appoiutment of a receiver to take charge of, manage, and control a patent does not vest in him title to the patent which will enable him to maintain a suit for its iufringement in his own name, Rev. St. § 4919 (U. S. Comp. St. 1901, p. 3394), giving the right to recover damages only "in the name of the party interested either as patentee, assignee or grantee." To vest the receiver with such right of action, it is essential that the court compel or cause an assignment of the patent to him iu the name of the owner.

L. H. GILMER CO. v. GEISEL.

(Circuit Court, E. D. Pennsylvania, March 9, 1909. 168 F. R. p. 313.)

PATENTS—SUIT FOR INFRINGEMENT — PRELIMINARY INJUNCTION—LACHES.

A preliminary injunction will not be granted restraining a defendant from the manufacture and sale of an article alleged to infringe a patent, where the patentee, with knowledge that such article was being made and sold by defendant, delayed several years before bringing suit.

VICTOR TALKING MACH. CO. v. HAWTHORNE & SHEBLE MFG. CO.

(Circuit Court, E. D. Pennsylvania. March 12, 1909. 168 F. R. p. 554.)

PATENTS — INVENTION — IMPROVEMENT IN TALKING MACHINES.

The Dennison patent, No. 832,896, for an amplifying horn for talking machines, which consists of making the horn in two parts for reasons of convenience of shipment, etc., and providing a well-known means for uniting the parts for use, is void on its face for lack of invention.

NEWCOMER & LEWIS v. SCRIVEN CO.

(Circuit Court of Appeals, Sixth Circuit. Feb. 23, 1909. 168 F. R. p. 621.)

1. TRADE-MARKS AND TRADE-NAMES—MARKS — SUBJECTS OF OWNERSHIP — COLOR.

Color, except in connection with some definite arbitrary design, such as when impressed upon a circle, star, cross, or other figure, or employed in definite association with some characteristics which serve to distinguish the article as made or sold by a particular person, is not the subject of monopoly as a trade-mark.

2. TRADE-MARKS AND TRADE-NAMES—ORIGIN AND ADOPTION OF MARK.

The right to an exclusive trade-mark can only be acquired by its adoption for the very purpose of pointing to the origin or ownership of the article to which it is attached, and it must be designed to indicate the manufacturers or sellers, and to distinguish the article from like things made or sold by others.

3. TRADE-MARKS AND TRADE-NAMES — MARKS SUBJECT OF OWNERSHIP-COLOR.

Complainant held to have no trade-mark right in the yellow or buff color of a strip inserted along the seams of men's drawers, which is the natural color of Egyptian yarn, originally used in making the elastic seam of drawers made under a patent which has expired.

4. TRADE-MARKS AND TRADE-NAMES — MARKS OR NAMES SUBJECTS OF OWNERSHIP—DESCRIPTIVE WORDS.

The words "Elastic Seam," used to denote men's drawers having a knitted strip inserted along the seams, are deseriptive, and not subject to monopoly as a trade-mark.

LOWE BROS. CO. v. TOLEDO VARNISH COMPANY.

(Circuit Court of Appeals, Sixth Circuit. March 22, 1909. 168 F. R. p. 627.)

TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—INJUNCTION.

The words "High Standard," as applied to paints and varnishes, are in themselves descriptive of quality, and cannot be monopolized as a trade-mark; but where they have been used for a number of years by one manufacturer exclusively for a trade-mark, and have thereby acquired a secondary meaning with the trade and public as designating and identifying the products of such maker, their use by another in connection with similar goods in a way which may probably deceive purchasers will be enjoined as unfair and fraudulent competition.

PAGE MACH. CO. v. DOW, JONES & CO.

(Circuit Court of Appeals, Second Circuit, Feb. 16, 1909. 168 F. R. p. 703.)

1. PATENTS — INFRINGEMENT — PRINTING TELEGRAPH INSTRUMENT.

The Joy patent, No. 780,664, for a printing telegraph receiver, as to all claims except claim 12, held valid and infringed.

2. PATENTS—SUIT FOR INFRINGEMENT—DISCLAIMER—EFFECT OF DECISION OF PARTIAL INVALIDITY BY TRIAL COURT.

Where a Circuit Court, in a suit in equity for infringement of a patent, has held certain claims of the patent invalid, as too broad, but has entered an interlocutory decree grantiug an injunctiou and accounting for infringement as to other claims, from which defendant has appealed, the Circuit Court of Appeals, on an affirmance of the same, will not require complainant to enter a disclaimer, under Rev. St. § 4922 (U. S. Comp St. 1901, p. 3396), as to the claims adjudged invalid by the Circuit Court, until by the entry of a final decree he has had the opportunity to appeal and have such adjudication reviewed by the appellate court.

EMPIRE CIRCUIT CO. et al. v. CHANNON

(Circuit Court of Appeals, Seventh Circuit. Jan. 19, 1909. 168 F. R. p. 705.)

1. PATENTS—CONSTRUCTION-LIMITATION OF CLAIMS BY SPECIFICATION.

A claim of a patent calling in general terms for a "noncombustible and nonconducting material" cannot be limited by construction to a particular noncombustible nonconducting material named in the specification, either to avoid anticipation or infringement.

2. PATENTS—INVENTION—FIREPROOF DROP CURTAIN.

The Channan patent, No. 769,788, for a fireproof drop curtain for theaters, consisting of a double curtain, one wall of sheet metal and the other of a non-combustible and nonconducting material, with au air space between, is void for lack of iuvention iu view of the prior art, which disclosed a double drop curtain, with au air space between the walls, and also a double fireproof window shutter, one wall of which was of noncombustible nonconducting material.

CENTRAL OIL & GAS STOVE CO. v. SILVER & CO. et al.

Circuit Court, E. D. New York. April 8, 1909. 168 F. R. p. 712.)

PATENTS—INFRINGEMENT—OIL BURNERS.

The Wilder patents, No. 653,893 and reissue No. 11,905 (original No. 595,231), both for improvements in oil buruers of the wickless type, where the combustion takes place at the surface of the oil, the improvements consisting of raising and lowering the oil in the holder to facilitate ignition, are valid as limited to the particular means shown, but not as covering the result by whatever means accomplished. As so construed, held not infringed.

A. B. DICK CO. v. MILWAUKEE OFFICE SPECIALTY CO. et al.

(Circuit Court E. D. Wisconsiu. Oct. 5, 1908. 168 F. R. p. 930.)

PATENTS—CONTRIBUTORY INFRINGEMENT—INDUCING VIOLATION OF LICENSE RESTRICTIONS.

It is within the right of the manufacturer of patented printiug machiues called the "mimeograph" to sell the same under license contracts providing that they shall be used only with ink made by the seller, and third persons who with knowledge of such restriction sell a different ink to owners of the machines intendiug that it shall be used with such machines, and which is so used, are chargeable with contributory infringement which entitles the owner of the patent to an injunction.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Ephriam Wimer, Crabbottom, Va. Sash Lock.—This invention has for its object to provide a sash lock, adapted to be readily applied to a sash, and capable of securely locking the same in its closed position and in various adjustments, and of effectually preventing the sash from being raised from the exterior.

Hainline J. Allen, Biloxi, Miss. Oil Can.—An object of this invention is to equip an oil can with controlling means for permitting only a small portion of oil to escape at each operation of the oil can, whereby a saving of oil is effected and machines, such as sewing machines, typewriters, etc., are prevented from becoming soiled by an excessive amount of oil. Another object of the invention is to provide a device, adapted to prevent the spout of an oil can from becoming clogged, and capable of closing the outer end of the spout at each operation of the oil can to prevent the oil from leaking while the oil can is in an inverted position.

John Ljung, Alexandria, Minn. Saw Vise.—It is the aim of the present invention to provide a saw vise, adapted to clamp uniformly throughout its entire length, either narrow or wide-bladed saws, without permitting one end of a saw blade to vibrate loosely within it when the teeth of the saw are being filed. Another object of the invention is to provide a saw vise having a pivotally mounted saw frame, adapted to be arranged at different angles or inclinations, and secured in its adjustment by the means for attaching it to a bench or other support.

Edward V. Brown, New Albany, Ind., inventor; Adolph Day, same place, assignee. Insulator Bracket.—An object of this invention is to provide an insulator bracket, designed for supporting telephone, telegraph, and other electrical wires, and capable of being quickly applied to a brick or a stone wall, and of being readily removed therefrom without damaging the wall. Another object of the invention is to produce an insulator bracket, adapted to be applied to any corner of a building, and equipped with means for firmly anchoring it to the same, whereby it is effectually prevented from being pulled therefrom by a light strain, so that the danger incident to live wires, which result from the pulling out of the supporting brackets, will be practically eliminated.

John H. Brockman, Mason, Texas, inventor: Charles T. Brockman, same place, assignee. Reversible and Adjustable Heel Sweep—This invention has for its object to provide a heel sweep, equipped with opposite blades, adapted to be arranged at different angles to cut wide or narrow for cultivating different kinds of crops, and provided at each side with a cutting edge, and capable of adjustment to arrange either cutting edge at the bottom.

Frank X. Aumann, Manitowoc, Wisc. Folding Hat Rack and Kneeling Stool for Pews.—An object of the present invention is to provide a combined hat rack and kneeling stool, designed to be applied to the pews of a church, or other place of worship, and capable of being compactly folded beneath a pew so as to be out of the way when not in use, the hat rack being movable from its folded position for use, when the kneeling stool is moved from its folded position.

Philip Bernard, Jefferson, S. D. Four patents.—The first patent relates to a hog waterer, equipped with means for enabling a considerable amount of water to be maintained at a temperature above freezing in the coldest weather, with the expenditure of a comparatively small amount of heat, affording the animals a clean drink at all times, and preventing the water being either fouled or wasted.

The second patent covers a chicken waterer, designed to be placed on the ground or any suitable support, and having a heating attachment for preventing the water from freezing in cold weather, and adapted to be used without the heating attachment in warm weather.

It is the aim of the invention of the third patent to provide an automatic watering trough, adapted to maintain the water at a predetermined level, and capable of automatically feeding the water to the trough as rapidly as it is consumed, the trough being provided with adjustable means for controlling the flow of water and also the depth of the same within the trough.

An object of the invention covered by the fourth patent is to provide a stock waterer, designed for affording both hogs and cattle a supply of fresh water, and adapted as the water is consumed to feed a fresh supply into the troughs, and capable of automatically cutting off the flow of water when the same reaches a predetermined level. A further object of the invention is to enable the troughs to be readily cleaned when desired, and to provide economical means for preventing the water from freezing in cold weather.

James W. Brown, Winnsboro, Tex. Flue Cleaner.—This invention has for its object to provide a simple and inexpensive flue cleaner, designed for removing scale and other accumulation from the flues of steam boilers, and adapted when worn to have its flue engaging members, which are made of wire, readily renewed at a small cost.

John T. Eady, Carrollton, Ga. Attachment for Road Machines—This invention has for its object to provide means, adapted to be readily applied to the scraper of a road machine, for enabling the latter to tear down embankments at the side of a road and to tear up effectually gravelly and other hard ground, this result being accomplished by a simple addition to the scraper blade of a longitudinal adjustable bar.

Aage Foss and Loren Coolidge, Montesano, Wash. Log Turner.—The object of this invention is to provide a log turner, capable of enabling a log to be handled with greater facility than heretofore in both moving it from the log deck to the carriage and in turning it on the latter, which will be easy on the timber, and which is adapted to turn a log either against or from the knee of a head block, and capable of engaging the log either at the top or bottom to arrange either the top or bottom face of the log at the front.

Simon Frigone, Chicago Lawn, Ill. Weather Strip.—The object of the present invention is to provide a weather strip, adapted to be readily applied to an outside door, and capable of cutting off the draft and preventing rain and snow from blowing under the door, and equipped with means for automatically supporting it in an elevated position when the door is opened.

Charles Fowler, Eldon, Mo. Switch Stand Lock.—It is the aim of the present invention to provide a switch stand lock, designed to eliminate the use of padlocks for securing the switch levers of switch stands, so as to be readily applied to any ordinary switch stand at a cost less than the price of the padlocks now in use, and capable, when the switch lever is partially thrown into a notch or recess of a switch stand, of securely locking the switch lever and of effectually preventing the same from jumping out of such notch or recess when the wheels of a train pass over the switch points.

Lewis Franzmeier, Timothy, Wisc. Windrower.—An object of this invention is to improve the means of attaching the front ends of the rods of a windrower to the cutting apparatus of an ordinary mower, and to provide a side delivery windrower, designed and adapted to permit the rods to have an individual limited vertical osciliatory movement to conform to the configuration of the ground.

Oscar Herrmann, New York, N. Y. Danger Signal for Automobiles.—The present invention is designed to provide a danger signal, adapted to be placed at the back of an automobile to prevent rear-end collisions, and capable of being exposed at the will of the operator and of displaying an illuminated signal at night, or cut out during the day time when the light is unnecessary.

William H. Gerhard, Austin, Tex. Folding Bracket for Desk Telephones.—An object of the present invention is to provide a foldable bracket, adapted to be readily applied to a desk, and capable of adjustment to bring it in position for use, or to arrange it out of the way when not in use. Another object of the invention is to provide a flexible bracket, adapted when not in use to be arranged beneath the telephone or other article supported by it, and movable inwardly and outwardly to and from its folded position by exceedingly small adjustments, whereby a telephone, or other object supported by the bracket, may be arranged in a greater variety of positions than heretofore.

Thomas J. Goodwin, Cleburne, Tex. Wire Basket.—The object of the present invention is to provide a simple and inexpensive wire basket, designed particularly for grocerymen, hucksters, and the like, and adapted to successfully stand the hard usage to which such baskets are subjected, and capable of being compactly nested for shipping and storage.

William J. Keegan, Winthrop, N. Y. Drilling Machine.—An object of this invention is to equip drilling machines with simple and efficient means capable, after a hole has been drilled, of rapidly raising or withdrawing the drill from the hole, and adapted to afford a quick adjustment of the drill to save time in positioning the drill properly with relation to the work.

Christopher Kibat, Belvidere, Ill. Sled Propeller.—The present invention is designed to provide a propelling device, adapted to be readily applied to a sled, bicycle, automobile, or other vehicle, equipped with motive power, and capable of enabling the same to be positively and rapidly propelled either on a level surface or up an incline.

Jeff. D. McCabe, Woodbury, Tenn., inventor. Two patents. J. P. Youree, Readyville, Tenn., assignee of the first patent. Robert L. Mason, and Benjamin Lawrence, Woodbury, Tenn., assignees of the second patent.—The first patent covers a hoe or rake having means for securely attaching the blade to the handle, the securing means being equipped with a yieldable device for preventing the parts from becoming loose and rattling.

The second patent relates to a buggy shaft support, adapted when the shafts are swung upward after unhitching a horse, to automatically hold them in an elevated position, and capable of automatically releasing the shafts when the same are pulled downward with the necessary force. The invention is designed to be applied to buggies, equipped at the top of the spring with either a wooden spring bar or a metallic body loop, and the parts of the shaft support are arranged to be adjusted vertically to adapt them to the height of the spring bar or body loop and to the position of the cross bar of the shafts.

Charles E. Ratcliffe, Paducah, Ky. Nut Lock.—An object of this invention is to provide a nut lock, adapted to enable a nut to be readily screwed on a bolt in the usual manner, and capable of effectually preventing the same from accidentally unscrewing, and of permitting the nut to be removed when desired without injuring it or the bolt.

Dr. James M. Shepard, Findlay, Ohio. Adjustable Door Hinge.—This invention has for its object to provide a hinge adapted to be easily applied to a door, and capable of being readily adjusted to counteract sagging without removing either the door or its hinges, and without planing the former.

John Schuster, Algoma, Wisc. Hog Catcher.—An object of this invention is to provide a hog catcher having gripping jaws and capable, when pushed against the leg of an animal, of automatically gripping the same and of securely locking the gripping jaws in their engaged position.

Linnaeus Winans, Portland, Ore., inventor; Audubon Winans and Ephriam Winans, Hood River, Ore., assignees. Rail Joint.—An object of this invention is to provide a combined joint support and rail brace, adapted to effectually overcome what are known as sagging joints, and capable also of preventing the rails from spreading on both curves and straight tracks. The improved rail joint is adapted to be placed on any kind of rails and on any kind of ties as quickly as the parts of an ordinary rail joint can be assembled.

Frank L. Watson, Lynchburg, Va. Steam Traps for Radiators.—It is the aim of the present invention to provide a steam trap, adapted to be readily applied to radiators without necessitating any alteration in the construction of the same, or the return pipe, and capable of preventing steam from entering the return pipe and interfering with the operation of the system or causing "hammering." The trap has a seal, which while effectually excluding steam from the return pipe will permit the escape of the air.

William S. Schwartz, McCoy, Ore. Lemon Squeezer.—While this invention is primarily adapted to serve as a lemon squeezer, it can be employed for expressing the juices from various fruits. The device is portable and is adapted to express the juice from a number of lemons in one operation and catch and deliver the juice to a suitable receptacle. The invention is of simple construction, easy of operation and cheap to manufacture. It comprises essentially a clamp for attaching the device to a table, a bowl mounted thereon, a slotted cylinder mounted on a bowl, a cone at the bottom of the cylinder and within the same, and an expressing device movable over the cylinder and provided with a plunger which operates within the cylinder for forcing the juice through the slots of the cylinder into the bowl.

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FOR SALE—Button Fastener, Patented Jan. 25, 1910. It talks for itself. Consists of staple and ring. Will not come out or tear cloth. Will sell, trade, royalty, stock interest or organize factory. Address, J. L. Nelson, Clarksville, Ark. jy

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FOR SALE—U. S. Patent No. 946,419. Folding Shipping Crate. For full particulars address, Adolf Wyss, Brandsville, Mo. jun

FOR SALE—Patent No. 919,116, dated April 20, 1909. Trap. One that catches and kills. Also Canadian patent. For particulars write, Henry Barber, R. F. D. Olmstead, Illinois. jun

FOR SALE—Patent No. 939,855, on a Dry Clay Gathering Machine; either outright or on royalty. Address, C. E. Olden, No. 620 North Main St., Mason City, Iowa. jun

FOR SALE—Patent No. 621,154. Cow Tie. Will permit an animal great freedom when grazing. Will sell on royalty basis. Address, P. T. Pederson, Box 161. Milnor, North Dakota. jun

FOR SALE on royalty—U. S. Patent No. 989,828. Tap screw plug, for plugging leaks in range boilers or pipes. Address, E. A. Gehrke, No. 330 North 13th St., Lincoln, Nebr. jun

FOR SALE—Patent No. 938,528. Combined tie lifter and holder used in railroad construction. No reasonable offer refused. Address, Thomas Warren, Palenque, Via Colon, Republic of Panama. jun

FOR SALE or royalty—U. S. Patent No. 932,951, issued Aug. 31, 1909. Wrench. No screws, springs or teeth to play out. Strongest, cheapest and handiest wrench on the market. Address, A. R. Bell, Evesham, Via Macklin, Sask., Canada. jun

FOR SALE—U S. Letters-Patent No. 935,391. Haying and Manure Loading Machinery. Three years test. Might consider royalty. Canadian patent pending. Write for particulars, John B. Mohan, R. F. D. No. 1, Effington, South Dakota. my

FOR SALE—Patent No. 943,495, dated Dec. 14, 1909; bolster for log wagons; has adjustable chocking device; will accommodate loads of different sizes; an invention of real merit. Address, John T. Warren, Hemphill, Texas. my

FOR SALE—U. S. Patent No. 937,631, Plumb Level. A very valuable invention. Fortunes in it. Will sell outright or part cash and royalty. Address at once, J. E. McMahal, Boulogne, Nassau Co., Florida. my

FOR SALE—U. S. Patent No. 938,580, issued Nov. 2, 1909. Punch. Will punch from the lightest tin plate to No. 20 gage iron, with one hand. For particulars write, Ferdinand Harling, Shenandoah, Iowa. my

FOR SALE—Patent No. 910,785, issued Jan. 26, 1909. The ultimate universal detachable sanitary soap dish. Fits all basins. Holds soap firmly when throwing water out. A boon to all homes, camping and outing parties. Can be manufactured at small cost. Apply to T. C. Colton, Griswold, Man., Canada. my

FOR SALE—U. S. Patent No. 927,356. Also Canada and Great Britain patent rights. Wonderful heating drum: throws all the heat down: absolutely no odors: burns half the gas of any stove of its size known. Will sell one or all three patents. For description, illustration, etc. address, Dr. W. S. Keyser, Everett, Wash. my

FOR SALE or on royalty—U. S. Patent No. 949,310, dated Feb. 15. 1910. This invention relates to a detachable button which is useful for all kinds of garments. Can be put through between the goods and locks itself. Can be taken off without leaving any mark. Also useful for uniform garments. Canadian patent applied for. Address, Joseph Tams, No. 208 Mulberry Street, Trenton, N. J. my

FOR SALE—Patent No. 910,950. Concrete Ornamental Lawn Fence. Very attractive. Will sell right or half interest. Pays to market. Full particulars with pleasure. Address, Box 9, St. Jacob, Ill. my

FOR SALE—Patents Nos. 916,868, dated March 30, 1909, agricultural implement: Patent No. 911,983, dated Feb. 9, 1909, belt replacer; and 911,876, dated Feb. 9, 1909, cultivator. Inventions also covered by Canadian patents. Will consider proposition for royalty, or will exchange for land and part cash. For further particulars address. John Horinek, Atwood, Kansas. jy

FOR SALE—U. S. Patent No. 889,151, granted May 26, 1908. Street Car Fender. Has telescoping section to save persons struck by moving car. Address, H. M. Prater, Box 27, Crocker, Missouri. my

FOR SALE—Patent No. 934,571, Automatic Dip Tank for all kinds of stock. Stock go under tank and get dip on back, runs all over them. Protects stock from flies and all insect pests. Set in pasture in front of stall. Address, E. M. Reckards, Ozawkie, Kansas. my

FOR SALE—Patent No. 939,240, dated Nov. 9, 1909. Whip Socket. Locks securely by downward pressure on whip handle. If interested write for copy of patent. Address, R. Habekost, Squirrel, Idaho. my

FOR SALE or Trade—Patent No. 922,740. Just put on the market. A money maker. Plenty of territory. Write for full particulars. Address, Wells & Meek, Lock Box 385, Kahoka, Mo. my

FOR SALE—Patent No. 932,806, Aug. 31, 1909. Collapsible Box. Can be used for egg cases, fruit cases and boxes too numerous to mention. Will sell same at a reasonable price. Address, Oscar A. Paulson, River Falls, Wisc. aug

FOR SALE—Patent No. 583,494. Combination Book-Shelf and Book-Support. An excellent support. Easily applied to fit any shelf and books. Reasonable price. Address, August Lundberg, 41 Catherine St., Worcester, Mass. my

FOR SALE—The best Can Opener on the market, patented December 24, 1907, patent No. 874,457. Will sell outright at reasonable price. Would like to hear from any one who buys patents. For further information address, L. P. Therriault, Bonfield, Ont., Canada. my

FOR SALE—Patent No. 947,455. Combined Cultivating and Insect Destroying Machine. A necessity to potato growers, as it works without the use of poison. Will sell outright: reasonable. Address, Joseph Peil, Bloomer, Wisc. jun

FOR SALE—Patent No. 642,404. Cross Line Buckle. Will admit of attaching or detaching short check at will. Can be attached to long line any place without pulling the end through. Can be manufactured as cheaply as the ordinary kind. Very strong and durable. Will sell outright or place on royalty plan with reliable firm. Address, H. P. McGowan, Hurley, Okla. jun

FOR SALE—U. S. Patent No. 943,454, granted Dec 14, 1909; Canadian Patent No. 123,625, dated Feb. 1, 1910. Mothers Sewing Companion. The primary object of the invention is to provide a portable stand that will serve the purpose of a pin cushion, work basket and shelves for toilet articles. All in a compact form. The shelves may be rotated until the desired article is within reach of the operator without the latter changing her position. Address, S. Pecoy, Cresco, Iowa.

WANTED.

WANED—To buy or manufacture on royalty a meritorious patented article. One in general demand preferred. Will deal with inventor only. Give description, terms and conditions. Address, Manufacturer, P. O. Box 754, Chicago, Ill. jun

WANTED—To correspond with patent owner of an article of merit, always seasonable, not perishable, and marketable any place. We manufacture and sell. Address, W. H. Davis & Sons, Newark, Ohio. my

WANTED—A company to buy or manufacture on royalty our automatic car coupling, U. S. patent No. 933,924, and Canadian patent No. 111,381. The best automatic coupling ever invented. Address, George Sarrazin & Hector Perreault, No. 653 Canal St., Holyoke, Mass. my

WANTED—1000 ratchet braces manufactured for cash or on royalty U. S. patent No. 878,404, issued Feb. 4, 1908, and after they are sold as many as the trade demands. Address, Israel Larson, R. F. D. No. 2, Box 179, Sandy, Utah. my

WANTED—Financial assistance in protecting and exploiting five inventions having originality and merit which will commend them to the countries of the world. Liberal interest will be given in the patents to be procured in exchange for the capital necessary for the making of models, incidental and other expenses. For full particulars address, John Horinek, Atwood, Kansas. jy

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Appeal in Patent Controversies.

The bill to create a new court of patent appeals has been favorably reported to the Senate by the committee which has had it in charge. The need of such a court has been obvious for years to students of the conditions relating to patent law and its administration by existing courts. As pointed out in the report, the judiciary act of 1793, when adopted, provided for a single court of appeals in all cases. The Supreme Court of the United States was the single and only court of last resort recognized by that act. Nearly a hundred years passed before the law was changed, for it was entirely satisfactory to litigants, lawyers and the public, so long as the Supreme Court was able to take care of the business brought to its docket. No class of litigation suffered and cases in general were given satisfactory treatment. But as the volume of business increased, and the number of cases became so great that it seemed that years might elapse before some of them were reached, the necessity for some means of lessening the pressure upon the court, and of affording ligitants prompt relief, became obvious. It was impossible for the judges of the Supreme Court to consider adequately and satisfactorily, either to themselves or to the public, the increasing number of cases brought to it on appeal. In 1891, therefore, the circuit courts of appeal were created by an amendment to the judiciary act, and the results have been what was hoped for in all cases except those relating to patents. In the latter class of cases, the rights of the public and of patentees are still in confusion and uncertainty.

The nine circuit courts of appeal have exercised their jurisdiction as courts of last resort in litigation over general matters without such confusion and uncertainty. This is due to the fact that, as a general proposition, a decision in litigation of this sort has been final and binding with respect to the parties to the suit and to the subject-matter involved. In patent cases the reverse has been true, because a patent right is co-extensive with the United States, and yet it is the subject of determination of nine different courts of last resort, no one of which is bound by the other. The result is a conflict of judgments and a confusion of titles. The reports of the circuit courts of appeals abound with instances of this confusion in respect to patent titles. Under the present system, a patent may be decreed to be valid by the circuit courts of appeal in eight circuits. If, in the ninth circuit, the court decrees the patent to be invalid, the patentee has lost part of the benefits of the decisions in the other eight circuits, because in the ninth circuit anybody may manufacture the article and it may be sold throughout the United States. Such a condition is of course destructive of the rights of the patentee and is also an injury to the public.

As Senator Brown, the Chairman of the Senate Committee on Patents, said in submitting the committee report to the Senate, any system which resulted in litigation of that kind, of which there were many instances, called for readjustment. The only adequate remedy is the creation of a single court of appeals, which should have exclusive appellate jurisdiction in patent cases. It would hear and determine appeals and writs of error from final judgments and decrees in circuit courts of the United States, in cases arising under the laws relating to patents for inventions. Its decisions would be final within its jurisdiction, though, of course, the Supreme Court might review them in certain cases.

The public is entitled to know whether it has a right to make, use or trade in any article of commerce at the end of a decision of one court of last resort, and ought not be compelled to wait on the harmonious judgment of nine courts of last resort. On the other hand, the rights of the patentee can be clearly established only through the decisions of a single court of this kind. The proposed legislation is chiefly in the interest of the inventors of the country. The patent system of this land should be strengthened so that the man who invents something will be given a chance during his life, and will be on even terms before the courts with those great corporations which are interested in the control of patents covering an entire field of industry. The expense of the court would not be great, as the associate justices would be drawn from the different circuits for service at an annual session. We earnestly hope that the bill will receive favorable attention, and be enacted into law.

To keep themselves posted in the progress of the arts in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication entitle it to the support of all the inventors of the country.

Postage Rate on Periodicals.

The proposed increase of the postage rate on periodicals has led to widespread discussion, and to the expression of contradictory views. The suggestion was made by the Postoffice Department—and it received the approval of President Taft—that the present postal deficit be covered by raising the rate on second-class matter (other than daily newspapers) on the ground that the deficit was really due to this matter. This deficit now amounts to $17,000,000, and the Department claims that the loss on second-class matter is $64,000,000 a year, and that the publications which pay only 1 cent a pound postage cost the government over 5 cents a pound to carry. The Postmaster General estimates the average length of haul of monthly and weekly papers as over one thousand miles, and that of dailies 300 miles, and claims that in view of this extra expense, the first named periodicals should be charged a higher postage rate.

These statements have been denied by the Publishers' Association, and by the editors of important journals in the country, many of whom have testified before the Congressional committee in charge of the postoffice appropriation bill. They point out that it is a practical impossibility to say how much of the deficit is to be attributed to any class of mail matter, much less to any division of one of these classes. The fact that the weight of the periodicals carried decreased 18,000,000 pounds in one year, while the expenses of that year increased $18,000,000, shows that all the loss cannot be justly ascribed to this special item. The accuracy of the statement as to comparative length of haul is also questioned. All these assertions are founded on rough estimates, and are so general in character that they should not be taken as a basis for legislation. Other causes, the publishers declare, should be also held responsible for the deficit. No exact account, for instance, is kept of the cost of the franking privilege, which is more abused than any other granted by the government. It is well known that Congressmen, as well as all the Departments, frank enormous quantities of mail matter, even typewriters being sent through the mail in this way. It is calculated that this sending of letters, documents and other articles without paying postage on them costs $20,000,000 a year: but this is not entered in the expense account. Rural free delivery is also costly: and it is an open secret that the railroads make huge profits from their mail contracts.

But even if it could be proven that the periodicals alone are to be blamed for the Department's annual loss, it does not necessarily follow that they should suffer an increased tax. They reach a class of subscribers that no other papers do, and indirectly bring in revenue to Uncle Sam through their advertisements. The fact that a single advertisement may call forth thousands of letters—as has been proven to be the case—all of which pay the 2 cent postage rate and are therefore profitable to the government, shows the co-relations of the different classes of mail matter, and illustrates again the difficulty that arises when it is attempted to deal with any one of them separately. It is as hard to distinguish the losses and profits as it would be, in the Patent Office, to determine the relative expenses to the government of granting design or mechanical patents. A Congressional committee appointed some years ago for the special purpose of fixing the cost of transporting second-class mail matter, has never been able to report definitely. Periodicals are handled by the same postmasters and clerks who handle other mail, the only distinction being that in certain railway mail routes, separate employees handle letters, the others handling merchandise, printed matter of all kinds, newspapers, etc.

The discrimination against the magazine as compared with the daily papers, is not justified by the assertion that the latter are carried shorter distances. It is true that magazines are transported on short hauls by the express companies and that the mails have the burden of the longer conveyance; but that is true of the newspapers as well Many people believe that the real cause of the discrimination is that any suggestion to tax the daily press would be met by such powerful opposition that it is not even considered. On the other hand, an increase of the rate on magazines would add to the profits of the express companies. Some even think that the independence of the magazines, and the fact that they have attacked the policies of both the Administration and of certain Congressional leaders more openly than the newspapers, is the real ground for the discrimination. The majority of the people, outside of the city, do not take daily papers. The average farmer cannot afford to pay $6 a year, when he can get a weekly or monthly epitome of the news for $1 or $2. If the rate is changed as proposed, he would have to pay the extra cost. The magazines would go back to the old idea of years ago, of asking the subscribers to pay the postage, or the subscription price would be increased in proportion to the additional expense. Why should a man, because he chooses to take a monthly instead of a daily paper, be asked to pay this tax? The rate would work hardship to a class which, more than any other, needs to be brought into touch with current events. It would make the isolation of farm life a juster ground of complaint than it now is.

The real solution of the deficit problem, as one publisher of international fame pointed out in his testimony before Congress, is to take the Postoffice Department out of the realm of politics. Let there be a Director of Posts who is not appointed as a reward for party service, but on account of his personal qualifications for the position. Let him reorganize the whole department on the same basis. When it is remembered how loosely this huge business, amounting to $200,000,000 a year, is conducted, the marvel is that the deficit is so small. At present, the service is a great

political machine, and the country has grown so accustomed to the condition that it accepts as quite natural and proper the current method of filling thousands of postoffices with incumbents whose claim to the positions is founded primarily on fidelity to party tenets, instead of on their fitness for the office. That the postal service can be run on a paying basis is shown by the experience of most civilized countries. The argument that Europe offers no standard for us, because of the widely different conditions here—the long distances mail is carried, etc.—is met by the striking fact that Canada, where the conditions are parallel with our own, not only avoids a deficit, but makes a regular profit, and charges only one-fourth of a cent a pound on second class matter,—a quarter of our rate. It is true that the parcel post system is very advantageous to Canada, and that in this country the express companies wax fat on profits which should accrue to the government. The postal savings banks may also help in this line; but the fact remains that Canada considers the dissemination of this class of literature of such importance that instead of increasing the rate, she has lowered it. Until last year, it was half cent a pound, and it was then reduced to one-fourth: and in spite of this reduction there was a surplus of over $800,000. If our service could be conducted along similar lines of efficiency and economy, the result would be the same.

Bicycle Automobile.

A novelty in the automobile world is a two wheeled motor car recently patented. It is not a motor bicycle, but a motor car in everything but the number of wheels. To hold the machine steady before starting, an ingenious device is provided in the shape of two runners concealed behind the foot boards, which let down automatically when the steering wheel is released from the operator's hand, and support the car in an upright position. A seat is mounted over the rear wheel and if necessary another seat can be added behind—not a saddle, but a cushioned seat, with a special arrangement of springs, comfortable enough for a long trip. Or instead of this second seat, one can adjust a deck over the rear mud guard to carry parcels, so as to adapt the machine for delivery purposes on a small scale.

The engine is a three by three inch, two-cylinder, two cycle valveless type, of 8-horsepower, developing 12-horsepower, and the muffler is protected so as to do away with the loud disagreeable explosions of the average motor cycle, making no more noise than a sewing machine. The sparking is by magneto; transmission has multiple disk clutches, with two speeds. The tank holds four gallons of fuel, making the motor available for long trips.

The wind shield is also a novelty, presenting a small, convex surface of glass to the wind—large enough to protect the driver's face, and small enough to be out of the way. The steering knuckle not only turns the wheel but shifts the center of gravity, aiding in the easy direction of the machine.

Automatic Violin.

The various pianolas, aeolians, and other automatic piano players have become so popular, and have been so successful, that a device has been invented to operate the violin in a similar manner. The player requires no alterations in the violin itself, and any instrument may be placed therein and removed without injury. The parts are pneumatically controlled in a manner similar to that of the ordinary piano player. A perforated music sheet selects the notes which are to be sounded. This sheet travels over a "tracker board" provided with the usual ducts, in which an exhaust is maintained. There are two ducts for each note, and as these are uncovered by perforations in the music sheet, the air rushing into one of the ducts through the medium of the usual valves and pneumatics, presses a finger down on one of the violin strings at the proper point on the finger board, while the air in the other ducts puts into operation the bowing mechanism of this string. The bowing is done by means of four crystal disks, one for each string. The violin offers peculiar difficulties for automatic operation, and it has been regarded as an impossibility to get good music from it in any other way than by the human hand: but it is said that the present invention works well, and that through the devices for regulating the softness of the sound (which resemble those familiar on the piano player) all desired effects can be produced by the operator.

A Dry Gas.

Ordinary artificial gas is of two kinds—carbureted water gas and coal gas. Nearly all the gas made in this country is of the first kind, because of its high illuminating value, but efforts are being made to introduce a dry gas, to be used for purposes of heat, lighting and power. It is composed mainly of a combination of compressed air and gasoline, and the process of manufacture is said to be a third cheaper than that employed by the large gas companies.

The water gas in common use is made by the decomposition of steam at a high temperature by incandescent carbon, thereby producing hydrogen and carbon monoxide. As the gas in the process of manufacture passes from the generator to the carburetter, it is enriched with oil, which gives the gas the quality of illumination. The use of this gas has many disadvantages, which it is believed the new product will obviate. It is not intended at present, however, to compete with the gas plants in the large cities, but to install factories in smaller towns, large country hotels, etc., where gasoline engines are at present used. An ordinary gas engine is used for the production of the dry gas. Tests with the Busey burner, as the appliance is called, showed that it would melt copper in an open flame in 25 minutes, and Babbitt metal in five and a half minutes. Cast iron can also be easily welded. The gas can be used in a range for cooking or in a furnace to heat a dwelling and no soot is given out, nor any moisture which would be perceptible upon a pair of eyeglasses.

There is increasing interest in marine circles in the substitution of gas for steam for propelling vessels, and it is said that the new British battleship Lion, which is to surpass the Dreadnaught and be the most powerful ship of that class in the world, will be provided with gas engines, thus doing away with funnels or smokestacks. The dangerous characteristics of gasoline have hindered development in this direction, but the dry gas promises to be well adapted for such purposes. Plans for its use in naval construction are to be laid before the Navy Department in the near future.

Water Captures Air.

At the Victoria mine in northern Michigan, an ingenious engineer has captured a river and imprisoned the air along with it. The river is forced to take an involuntary plunge of great height, and in the process drag in and compress the atmosphere by means of which the entire plant is operated. Into the depths of the earth three great parallel tubes have been sunk, each 343 feet in length by five in width. The unsuspecting river has in falling been guided into these and sent twice the distance that Niagara's cataract leaps, into the earth's interior. Near the surface connecting with these three intakes are a number of tubes, which bring the air in contact with the streams as they begin their descent. The swift rushing waters, sucking the air into the tubes, break it up into bubbles, and bear it to a chamber below, where the force of the torrent indirectly compresses it. This chamber is a great cavern cut out of the solid rock—281 feet long, 26 feet high, and 18 feet wide.

When the columns of water fall they are borne by the tubes that confine and conduct them, beneath the surface of a permanent body of water in the bottom of the shaft. The imprisoned air whisked in a myriad of bubbles with lightning speed through the enclosing tubes, is forced to come to the surface of the water in the especially prepared compressor chamber. There is nothing else for it to do. All outlets, even those for the escape of the water after its work is done, are closed. The mine engineer in charge is able, by means of valves, to close and open these outlets at will.

After it has done its part in capturing the air and confining it safely within the cavern, the water is carried away through the tail-race. Farther on it finds its way to the surface once more through four exit pipes. The point at which the water emerges is lower than that at which it originally entered the tube which bore it to the earth's interior. Moreover, the pressure in the air chamber is often greater than is required for the needs of carrying on the mining operations. The result is that, as the water rises to seek its own level and as it is impelled by the compressed air, where it emerges from its brief but exciting journey through the underground regions, it shoots forth with terrific momentum in a solid column, some 70 feet high and about a foot in diameter, and then descends in a column of spray. In cold weather this spray quickly becomes sleet, and sometimes forms a mass of ice as high as the column of water itself.

The mine plant is supplied with the compressed air, as needed, through a single intake tube. This tube is 24 inches in diameter, and from it smaller tubes lead off to various points, distributing the air as required. The total horsepower that may be developed from the three intake pipes is over 5,000.

Modern Sewerage Plant.

The first American city to install a truly comprehensive modern method of disposing of its sewerage is Baltimore. The pumps being installed are the most powerful ever constructed in this country, and their operation will be watched closely by the engineering fraternity all over the world, as other large corporations will copy them if they continue to work successfully. Each pump is designed to pump 27,500,000 gallons of sewerage every 24 hours against a head of 72 feet, and the three installed will be able to lift 72,500,000 gallons in that time. It is said that no other pumps in the United States can lift one half of this quantity against such a high head. They are intended to lift the sewerage of the low-lying sections of Baltimore, about the water front, over the hills adjoining Johns Hopkins Hospital to the big outfall sewer, through which it will flow by gravity to the disposal plant.

Each of these pumps weighs about 1,200,000 pounds. The heaviest castings weigh 30,000 pounds, and the valve chambers are more than 7 feet in diameter. The pumping engines are of the vertical triple expansion crank and fly-wheel condensing type, each having three steam cylinders, 22, 41 and 62 inches in diameter, and three single acting plungers, 40 inches in diameter, all of 60 inches stroke. The designed speed is 20 revolutions a minute. At normal speed each engine will develop about 600 horsepower.

Before the sewerage is pumped, it is put through treatment at the station. It passes through a screen chamber, below the level of the main floor, and there is also a large reservoir into which the sewerage is discharged. The sewerage goes first through a set of movable screens at the entrance of the screen wall, and again through fixed screens located over the suction pipes of the pumps. The movable screens are designed to take out the coarser materials, and are hoisted when it is necessary to clean them. Material collecting on the fixed screens is raked off by hand. The water is pressed out of this material collected, and the screenings are burned. The sewerage passes to the pumps and is discharged through cast-iron force mains to the outfall sewer.

The drainage pumps are 12-inch centrifugal pumps, driven by compound condensing engines of about 40-horsepower each, and have a capacity of 3,000 gallons per minute each. They draw water from the underdrains which are laid under the interceptors, and discharge it through the condensers of the sewerage pumping engines.

The machinery was made by the Bethlehem Steel Co., and it is said that the same degree of accuracy was used in making the large castings for the pumps as is employed in making the great guns for the United States government.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address.

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Vehicle dump-bed.....D. W. Carr
Vehicle dumping-body.....D. W. Carr
Vehicle, Motor-.....W. C. Price
Vehicle-spring.....D. R. Close
Vehicle-spring.....W. H. Smith et al
Vehicle-wheel.....J. C. Rutherford
Vehicles, Appliance for preventing side slipping of wheels on motor-.A. A. Mansell et al
Vehicles, Hand steering-wheel for motor-.....
.....G. Frentzen
Ventilating-shaft top.....R. Rawling et al
Ventilating system.....P. B. Bogart
Ventilator.....G. Kabureck
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Vessel-filling machines, Locking mechanism for
.....J. M. Hicks
Vulcanizing-press.....A. H. Harris
Wafer-machine.....D. Fabian
Wagon-bolster.....W. B. Milligan
Wall.....M. B. Ensminger et al
Wall-mold.....E. W. Collins
Wardrobe, Portable.....J. Leininger
Washboiler attachment.....W. H. Rich
Watch-holding case.....W. E. Porter
Water-closet seat.....H. S. Rumsey
Water-heating apparatus.....D. N. Gibson
Water-motor.....H. C. Phillippi
Water-tanks, Automatic regulating device for.
.....W. L. Brubaker
Weed-cutter.....M. Pruyn
Welded fabric.....C. Swinscoe
Wells, Cleaning oil-.....F. A. Flanegin
Wheel, 2 pats.....M. Lachman
Whiffletree.....L. E. Feinstein
Whiffletree-hook.....W. M. Wadleigh
Windmill.....J. P. Woydziak
Wind-motor.....D. D. McIntyre
Winding-frames, Measuring and thread-cutting device for.....M. Ebeling, Jr.
Window.....G. Hoehne
Wire connector, Ground-.....F. E. McKenna
Wire-stretcher.....J. Wright
Wrench.....F. Mossberg
Wrench.....C. A. and E. Rayman
Wrench for screwing flanges or sockets on pipes.....M. McLane
Wrench handle, Pipe-.....A. L. Moore
Wringer-roll.....E. Bruegel

DESIGNS.

Box-mat.....R. Gair
Carpet.....E. G. Sauer
Carpet.....J. Merry
Dish or similar article, Covered....C. Ziegler
Fabric, Textile.....J. Korzinek
Lamp, Street-.....L. C. Tarras

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Advertising device.....N. Stipkowitsch
Advertising device, Motion....A. H. Douglas
Aerial machine.....J. Beard
Air-brakes and economizing air, Means for releasing.....W. S. De Camp
Air-cylinder.....W. L. Abate
Air level inlet for house or other drainage, Fresh-.....R. Knox
Air- Separation of oxygen and nitrogen from liquid.....G. Claude
Airship.....J. A. Turnidge
Alarm and current-saving apparatus for automatic exchanges.....A. M. Bullard
Alarm call-box, Electrically-operated non-interfering.....P. A. Brown
Amusement device.....J. M. Ross et al
Animal foot-brace.....T. Kupfer
Armature for electric generators..H. Tideman
Ash-lift.....A. Sundh
Automobile-sign.....F. Coryell
Baby-jumper, Adjustable....E. E. Humphrey
Ball-grinding machine.....A. F. Rockwell
Band-cutter knife.....G. A. Hege
Bandage.....E. H. Saxe
Barrel-head fastener.....J. N. Clouse
Bath apparatus, Shower-.....F. E. Youngs
Bath-tub-molding apparatus.....T. S. Crane
Bath-tubs, Apparatus for molding undercut lugs on.....T. S. Crane
Bearing, Fluid-pressure thrust-...H. G. Reist
Bearing for shafts, Roller-.....T. F. Callahan
Bearing-roll with angular interspace.....
.....C. S. Lockwood
Bearings, Cone-lock for ball-.....J. J. Luckey
Bed, Recess-.....R. H. Anderson
Bed, Sofa-.....S. Karpen
Bedstead-frames, Securing device for.....
.....C. Vallone et al
Beer-rod.....M. W. Marsden et al
Bell.....J. R. Kidney
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Bending-machine.....J. Schlosser et al
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Binder attachment.....J. D. Roberts
Binder, Loose-leaf.....L. E. Shipman
Binding device, Flexible.....C. B. Smith
Blowpipe.....J. F. Mason
Boiler-cleaner.....B. F. Parker
Boilers, Means for retaining heat in steam-..
.....W. C. Clarke
Bolt and nut lock.....C. H. Ferguson
Boot tree or last.....W. W. Duncan
Bottle.....J. Auger
Bottle.....G. Hall
Bottle-caps, Apparatus for making and inserting.....C. F. Jenkins
Bottle-filling device.....A. R. Scutt
Bottle-washer.....R. J. Pfeifer
Bottles, &c., Device for applying adhesive material to.....S. B. Goff
Box.....W. S. King
Box-opener.....C. L. Curtis
Boxes, Partition for.....J. T. Ferres
Braces, Gentleman's.....E. Nesbitt
Braiding-machine.....A. C. Faire
Brake-beam.....P. B. Harrison
Brake apparatus, Safety release-magnet for...
.....W. N. Dickinson, Jr.
Brake-beam strut.....E. B. Busse
Brake-shoe.....H. Pries
Branding-machine.....H. Waibel
Brazing or welding rail-bonds, Apparatus for
.....C. R. Sturdevant
Bridge, Submerged.....W. Blanchard
Broom and scraper, Combination..J. S. Bender
Brush, Fountain-.....W. E. Miller
Brush, Rotary.....M. Cummins
Brush, Shaving-.....W. H. J. Downey
Buggy-top attachment.....W. P. Bliss
Building-block mold.....C. J. T. Cordes
Butter-cutter.....W. P. Hart
Button and necktie-fastener, Collar-.....
.....C. E. Morrison
Button, Cuff-.....J. A. Monroe
Button, Cuff-.....J. H. Simpson
Button-fastener.....H. G. C. Hörning
Buzzer or bell, Door.....W. R. Moore
Cabinet, Adjustable revolving grocer's.....
.....J. R. O'Connell
Cabinet, Ironing-board...H. Mendenball et al
Cable-clamp.....C. A. Butler
Cable connection.....O. Tangring
Cable-support.....T. A. Dissel
Caffein, Extracting.....H. Trillich
Can-closure.....G. A. Cibulka
Can-heading machine.....J. Eldridge
Cap.....A. Williams
Car-brake.....W. C. Marsh
Car brake mechanism.....E. Ramsay
Car brake-shoe, Street-railway-.....
.....J. A. Brownfield
Car-door.....J. E. Pearce
Car door, Grain-.....T. Oswald
Car door, Grain-...G. C. E. and A. E. Paget
Car draft-rigging.....F. Koch
Car-fender.....E. E. Close
Car, Railway motor-.....S. D. Reynolds
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Car-roofs, Construction of.....D. Tatum
Car-step.....D. F. Lemon
Car, Street-, 2 pats.....C. O. Birney
Car-unloading machine.....J. McMyler
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.....W. A. McWatty et al
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Carbon and producing it, Treated.....
.....P. J. Mulvey
Carburetor.....P. J. Dasey
Carbureter.....L. Anderson
Carriage-curtains, &c., Means for forming socket-holes in.....F. S. Carr
Carriage-door track.....E. Barth
Carriage pusher, Baby-.....H. Alban
Carriage-seat, Extension.....I. A. Sturtevant
Cash-register.....J. P. Cleal
Caster.....W. Goldbach
Casting apparatus.....A. Jameson
Ceiling-support.....D. Pemberton
Celluloid substitute.....H. Heydenhauss
Centering device.....V. Stroh
Check-controlled apparatus.....A. E. Acee
Check-controlled apparatus.....J. A. Wilson
Chimney-top.....G. W. Mueninghaus
Chuck, Rock-drill.....H. W. Schorlemmer
Churn.....G. W. Treece
Churn.....J. C. Rice
Churn.....W. J. C. Gaar
Churn.....J. McLean
Churn.....R. F. Roger
Churn and butter-worker, Combined.....
.....R. B. Disbrow
Cigar-bunch mold.....P. A. E. Scheer
Cigar-cutter.....F. and H. P. Eyden
Circuit-controlled switch.....W. Richmond
Clasp.....W. C. Michael
Clipper.....A. W. Rabe
Closure.....H. Deitz
Cloth-folding machine.....J. W. Gaunt
Clothes-holder.....L. L. Fonda
Clothes-line attachment for windows.J. Kehoe
Clothes-line support.....H. Herstein
Clothes-line support.....C. M. Follett
Clothes-rack, Folding.....O. Felts
Clutch.....J. S. Coates
Clutch, Friction-.....D. Noble
Coal and wood box.....W. B. Quick
Cock and faucet.....H. Mueller
Cock, Gage-.....R. R. Shapley
Cock, Gas-.....E. J. Farnan
Cocks, Rotatable index for.....H. Mueller
Coin-controlled machine.L. D. Broughton et al
Coin-wrapper.....E. Meyers
Coke-oven door.....J. J. Alley
Collar, Overcoat-.....L. Lyons
Collar supporter and retainer...D. Marinsky
Comb-cleaner.....G. H. Winter
Commutator-motor....E. F. W. Alexanderson
Compression-regulator.....J. B. Brown
Computing-machine.....W. P. Quentell
Concrete cattle-guard.....C. P. Murray
Concrete compositions, Manufacturing.....
.....J. W. Adams
Concrete construction, Reinforced.....
.....C. W. Peckham
Concrete-molding machine.....J. C. Dunton
Concrete pile and making the same.....
.....L. E. Welsh
Concrete sewer.....G. Dujardin
Condenser, Injector-.....W. M. Fleming
Conduit, Sectional.....O. K. Hugo
Container-top.....J. B. Williamson et al
Controller-regulator.....W. P. Casper
Controller-regulator.....A. S. Cubitt
Conveyers, Driving mechanism for sheet-.....
.....T. C. Dexter et al
Core-forming apparatus.....E. E. Brown
Core-machine.....O. K. Moore
Corn-shocker.....I. L. Dawson
Cotton-packer, Automatic.....W. B. House
Cotton-picking sack and holder.....
.....R. B. Montgomery
Counter, Automatic stock-.....P. H. Davis
Coupling-knuckle-pin retainer....E. P. Kinne
Cradle.....L. Vargas
Cream-separator.....F. C. A. Richardson
Cultivator, Adjustable hand disk.J. W. Watson
Cultivators, Cotton-blocking attachment for..
.....J. P. Horner
Current motor, Direct-.....A. L. Sohm
Current rectifier, High-potential alternating-..
.....C. H. Thordarson
Curtain and shade holder, Combined.....
.....G. A. Büchl
Currycomb.....C. C. Whetstone
Curtain-roller and curtain-pole supporter, Combined extensible.....J. W. Thoreau
Curtain-support, Adjustable.....C. R. Meyer
Cut-off for down-spouts or conductors.....
.....T. B. Burgert
Cutlery.....F. W. Sherman
Cutting-table.....W. J. MacFarland et al
Cycles, Adjustable crank-hanger for motor-...
.....A. L. Walters
Decanter.....J. H. Friedenwald
Dental swaging-machine.....E. O. Lothamer
Die.....M. Falk
Die.....W. J. MacFarland et al
Display-rack.....W. L. McCarty
Display-rack.....H. F. Mertz
Display-rack for windows.....E. Schreiber
Displaying device, Window.....F. C. Rhodes
Ditching-machine.....F. D. Meyer
Door-hanger.....I. Johnson
Door lock, Sliding-.....J. H. Herrick
Draft-evener attachment.....C. C. Hofwolt
Drawer registering and locking device, Cash-
.....W. H. Stepanek
Drier.....C. B. Stilwell
Drilling-machine.....W. L. Smith
Drink-shaker.....J. Heinrichs
Dry closet.....F. P. Smith
Drying jewelry &c., Means adapted for.....
.....A. W. Hutchins
Dye, Azo, 2 pats.....F. Runkel et al
Dye of anthracene series, Vat.....H. Raeder
Dye, Orange-red to violet.....M. Weiler
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Dyes, Yellow-red basic.....W. König
Eaves-trough hanger.....E. W. Dreher et al
Electric fixtures, Outlet-bracket for.....
.....N. Hublinger
Electric furnace.....A. Helfenstein
Electric heater.....F. E. Shailor
Electric meter.....A. Scheeffer
Electric-meter-service protective apparatus....
.....R. C. Cole
Electric oscillations, Apparatus for generating undamped.....S. Eisenstein
Electric switch.....D. E. Lee
Electric switch.....H. C. Robinson
Electrodes, Spacer and insulator for storage-battery.....L. H. Flanders
Electroller.....B. A. Stowe
Electroplating apparatus...N. S. Emery et al
Elevator safety device.....M. C. Schwab
Elevator safety-stop.....J. Skaba
Elevators, Protective apparatus for alternating-current.....W. N. Dickinson, Jr.
Engine.....M. B. Smith
Engine controlling device, Internal-combustion-
.....G. C. Sweet et al
Engine igniter, Gas-.....S. F. Briggs
Engine igniting device, Internal-combustion-..
.....R. J. Gibbon
Engine-muffler.....E. Troike
Engine seat and cabinet, Locomotive-.....
.....J. J. Ekstrand
Engine sparking device, Internal-combustion-..
.....L. K. Leahy
Engine starting device, Internal-combustion-..
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Engines, Means for preventing backward rotation of two-cycle.....J. G. Callan
Envelop-cutter.....C. A. Fischer
Envelop, Double-flap.....G. W. Cox
Excavating apparatus, Air-lock for.J. H. Gray
Excavating, raising, and dumping earth, &c., Machine for.....W. Castles
Excelsior-cutting machine.....M. Stewart
Exercising apparatus.....E. C. Gough
Expansion-joint.....J. D. Walsh
Explosive-engine.....J. F. Stahl
Explosive shell and making same...C. Stiriz
Expressing-machine.....J. J. Wheat
Extension-hook.....J. M. Zuk
Extension-table, Folding.....H. G. W. Ott
Eye-shade.....A. E. Alles
Fan, Motor-operated.....H. Manes
Faucet.....E. Peterson
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Feed-water regulator.....A. R. Herlache
Fence-wiring machine.....O. N. Baldwin
Fertilizer-distributer attachment for cultivators
.....E. and E. Jensen et al
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Filter-cleaning device.....L. V. Rood
Filter for cisterns.....C. C. Fifield
Filtering apparatus, Milk-.J. D. Reymore et al
Fire-escape.....T. Schulz
Fire-hydrant.....G. A. Owen et al
Fireproof building, Portable.....C. O. Lucke
Fireproof window construction..W. J. Larkin
Fishing-gaff.....W. E. Bettis
Flange sections, Manufacture of deep-.....
.....G. H. Everson
Float combustion-indicator..A. W. K. Billings
Fluids, Device for determining the force or velocity of.....G. H. Whitcher
Flushing apparatus.....J. A. Staples
Flushing-tank.....J. P. Glannon
Folding knife.....W. A. Hall
Furnace.....F. E. Swift
Furniture construction.....M. E. Stockwell
Fuse, Percussion-.....E. A. Gathmann
Fuse-replacing device.....W. L. Green
Fusee-caps, Making fiber.....F. Dutcher
Gage.....W. D. Hotchkiss
Garbage-can.....W. B. Osborn
Garbage crematory or incinerator..F. P. Smith
Garbage-receptacle.....C. Edgerton
Garment-hanger, Folding.....I. Anderson
Garment-supporter.....M. W. Miracle
Garter.....E. N. Humphrey
Gas, Apparatus for use in the manufacture of
.....P. Plantinga
Gas-engine.....W. S. Kellogg, Jr.
Gas explosion-engine.....W. S. Kellogg, Jr.
Gas for illuminating, heating, or power purposes, Manufacture of.....H. S. Elworthy
Gas generator, Acetylene-.....J. J. Kokesh
Gas generator, Acetylene-.....O. K. Stuart
Gate-operating device.....W. B. Stucker
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Gear, Variable-speed.....J. Sturgess
Gear, Variable-speed.....C. G. Stewart
Gearing.....J. Neswold
Gearing device.....W. F. Phillips
Gearing, Transmission-.....S. S. Scott
Glass-gate cutter, Water-.....F. Blodgett
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Glass-handling apparatus, Molten-.....
.....J. A. Chambers
Glass shield, Water-...H. Montgomery et al
Governor for explosive-engines, Reversing-...
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Grader.....J. W. Beasley
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Hair, Composition of matter to be used for the removal of superfluous.....C. J. Brown
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Hand-drill.....F. P. Shek
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Harvester, Corn-.....S. M. Houck
Hasp.....B. F. Brock
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.....C. E. Sackett
Hat holding and rotating device.F. D. Saylor
Hay-presses, Self-tier for.....B. F. Sweeney
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Hoisting and conveying mechanism.....
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.....T. A. Griffith
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Hose-gate.....A. T. Miner
Hotel-lock.....A. Arens
Hub, Wheel-.....G. W. Grooms
Incinerating receptacle and chute.N. W. Lowe
Incubator-heater.....J. W. Sauer
Insole-machine.....M. Watry
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Internal-combustion engine.....G. McDowell
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Ironing-board.....G. Wynder
Ironing-board and washstand, Combined.....
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Ironing-table.....A. H. Hauser
Irrigation-ditches, Head-gate for.G. L. Kinser
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Journal-bearing.....E. D. Priest
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Journal-box.....F. Helmick
Kerosene-burner for melting-furnaces and similar uses.....L. T. Kuehl
Kneading and mixing machine.....C. G. Ross
Knob construction.....A. Arens
Labeling machines, Label-supply mechanism for bottle-.....E. Ermold
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.....H. Wagner (Reissue)
Loading and unloading apparatus.....
.....A. L. English
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Lug-strap-supporting means...A. Derosier, Jr.
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.....C. M. Siebert, Jr.
Match boxes, &c., Striking-surface on safety-...
.....A. Swoboda
Matrices, Protecting.....H. Cohn
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Measurement, Device for inseam.....
.....F. W. Jacobi
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Metal and making the same, Compound.....
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Metal heating and separating apparatus.....
.....J. H. Reid
Metal-shears.....S. L. Bradley
Metallic films or flakes, Apparatus for making
.....T. A. Edison
Metallic leaf, Means for booking.C. E. Smith
Meter-box.....L. P. Andrews
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Milking apparatus teat-cup.....F. B. Shafer
Mining gilsonite.....T. W. Blake
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Milking-machines, Means for automatically delivering the milk from the vacuum-pipes of ..... C. E. Gane
Mixing-machines, Portable side-loading device for ..... T. L. Smith
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Molding-machine ..... W. Lewis
Mortise-lock ..... A. Lawrence
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Motor-control system ..... E. R. Carichoff
Motor, Means for effecting the control of an alternating-current electric ..... A. Sundh
Motor starting-switch, Electric- ..... E. Garside
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Music-leaf turner ..... F. C. Jungmann
Music-leaf turner ..... A. E. Babcock
Muzzle ..... J. H. Lipscomb
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Newspapers, Apparatus for associating, cutting collecting, folding, and delivering ..... J. A. Boyce
Numbering mechanism ..... E. P. Sheldon
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Nut, Top-prop ..... H. Higgin
Nut washers, Making lock- ..... J. E. Wilson
Oil-burner ..... H. F. Russen
Oil-burner ..... R. W. Cane
Oil burner, Crude- ..... F. W. Lanoix
Oil-conductor ..... J. R. Donnelly
Oiler for axles, Dust- ..... J. J. McGuire
Orchard-heater ..... C. F. Sweley
Ordnance sighting apparatus ..... E. Olsson
Ore-mill ..... T. C. Histed
Ores and metals, Treating ..... J. H. Reid
Organic substances, Reduction of ..... F. Bedford
Oven-door ..... F. V. Knauss
Ozone-generator ..... R. W. Rice
Package, Carboy- ..... A. G. Cox
Package-coating machine ..... D. L. Clark et al
Paddle-wheel ..... H. Dusek
Pail-tilting device ..... E. Goeke
Pan-lifter ..... R. Ray
Paper-bag holder ..... J. W. Dunnigan
Pen, Fountain- ..... F. C. Brown
Pencil-holder ..... E. Plourde
Phonographic recording apparatus ..... T. A. Edison
Phonographs, Duplex reproducer for ..... F. P. Beck
Photographic dark room, Portable ..... W. E. Buckley
Piano-actions, Extension-bracket for ..... F. C. Billings
Piano-flange ..... E. R. and H. C. Billings
Piano-hammers, Tool for removing ..... J. Knurr, Jr.
Piano-swell ..... S. W. Clark
Pianos, Combined music-rack and front panel for ..... L. W. Norcross
Picture-moldings to walls, Means for securing ..... F. C. Borgmeyer
Pictures, Machine for the production of mosaic ..... E. Karazej et al
Pin-fastener ..... G. Stach
Pipe-cleaning apparatus ..... W. A. Hall
Pipe-coupling for cars, Automatic ..... F. H. Harpster
Pipe opening and closing apparatus, Gas- ..... K. Höffler
Pipes, Treating metal ..... J. S. Patterson
Piston ..... F. C. Blanchard
Planter ..... T. J. Fuller
Planter, Hand- ..... L. R. Power
Planter, Seed- ..... W. A. Wilson
Plow, Sidehill- ..... J. N. Watrous et al
Plowing apparatus ..... R. J. and E. C. Bonin
Plug, Safety- ..... E. H. Bastion
Power transmission ..... A. N. Hadley
Press ..... W. G. Nymon
Printing-machine ..... J. A. Boyce
Printing-press, Flat-bed ..... W. S. Huson
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Proteo-cellulosic products, Obtaining ..... H. L. J. Chevasieu
Pulling-over machine ..... E. I. La Chapelle
Pump ..... P. A. Myers
Pump, Automobile- ..... R. A. Goeth
Pump, Oil- ..... N. McCarty
Pump, Rotary ..... S. L. Menge
Rail-fastening ..... E. E. Slick
Rail hanger, Elevated- ..... H. P. Hanson
Rail-locking cam and brace for tie-plates ..... R. Law
Rail-supporting device ..... E. F. Butler, Sr.
Rail tie and fastening ..... W. P. Day
Railway block-signal system, Automatic ..... L. O. Dickey
Railway-crossing ..... A. H. Havard
Railway-rail ..... C. H. Day
Railway-spike ..... L. E. Campbell
Railway-switch ..... S. L. Shellenberger
Railway-switch ..... J. F. Schmidt
Railway-switch, Automatic ..... J. E. Wright
Railway switch-thrower, Electric- ..... J. A. Posey
Railway-tie ..... J. R. Sneed
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Railway-tie ..... D. C. Funcheon et al
Railway-tie ..... C. E. Highbarger
Railway-tie, Metallic ..... S. McCloud
Railways, Iron cross-tie for ..... R. Hood
Razor-blade holder ..... L. A. Flinker
Razor, Safety- ..... G. Osborn
Razor-strop ..... M. A. Mihills
Receptacle, Automatically-locking ..... N. Krump
Reed-making-machine gearing ..... T. Bradford
Refrigerated serving-dish ..... W. H. Oskamp
Refrigerating apparatus ..... W. Cooper
Register ..... D. E. Scrafford
Rein check or stop ..... S. B. Anderson
Relay ..... G. F. Atwood
Relay, Current- ..... A. S. Cubitt
Resilient wheel ..... M. C. Overman
Reversing-switch, Overload ..... T. E. Barnum
Rheostat ..... H. J. Wiegand
Ribbon-vibrating mechanism ..... T. E. Buschmann
Road-working machine ..... J. M. Parcel, Sr.
Roofing construction ..... H. E. West
Rotary engine ..... W. M. Spencer
Ruler, Adjustable curve- ..... C. O. Harper
Sad-iron heater and oven, Combined ..... H. C. Goeltz
Safety-clasp ..... O. Sherman
Saliva-ejector ..... M. W. Levkowicz
Sash-fastener ..... G. W. Grodhaus
Saw handle, Crosscut- ..... R. Vaughn
Saw-handle, Removable ..... J. G. Harman
Sawmill-carriages, Offset for ..... H. S. Minor
Scaffold, Traveling ..... T. H. Schlarmann
Scoop, Weighing- ..... A. Himottu
Scow, Dumping- ..... W. W. Robinson
Scraper, Road- ..... J. M. Harrington
Screening mechanism ..... H. A. Goetz
Screw-driver ..... J. L. Dunning
Seal, Car- ..... C. E. Fox
Selector ..... J. L. McQuarrie et al
Separator ..... A. A. Shippee
Separator liner, Centrifugal- ..... D. T. Sharples
Shade-roller, Spring ..... E. F. Hartshorn
Shaker ..... C. Artner
Sharpener, Disk ..... J. R. Buttweiler
Sharpener, Lawn-mower ..... B. Hadley et al
Sharpening machine, Blade- ..... R. S. Green
Sheet-delivery ..... C. B. Maxson
Sheet-feeding mechanism ..... T. G. McGirr
Sheet-metal boxes, Machine for making ..... J. W. Denmead
Sheet or leaf holder ..... J. F. Hicks
Shock-absorber ..... R. G. Mueller
Shoe, Cushion- ..... J. A. Kelly
Shoe-ventilator ..... C. Koch
Shutter, Flexible or rolling metallic ..... J. G. and L. G. Wilson
Sickle-holder ..... A. C. Kious
Sign, Illusion- ..... L. A. Watkins
Signaling apparatus, Dial for selective ..... D. W. Kneisly
Silo ..... E. Hillard
Sleigh ..... B. Klein
Slicer, Vegetable and fruit ..... T. H. Tabor
Smoke-canopy-supporting bracket ..... C. E. Gierding
Snow and ice melting vehicle ..... C. R. Stedman et al
Snow-plow and rutter, Combined ..... J. Monpas
Soldering can-seams ..... C. W. Graham
Sound reproducer or recorder ..... C. Jr. and W. Thoma
Snow-plow and rutter, Combined ..... J. Monpas
Spark-arrester ..... J. F. Lavin et al
Spark-arrester and draft-regulator, Locomotive ..... R. J. Harle
Spark-coil vibrator ..... E. B. Jacobson
Spark-producing device ..... F. A. Thurston
Sparking device ..... T. H. McQuown
Speed-changer ..... P. H. Doherty
Speed-gage ..... A. Steinmeyer
Speed-varying transmission ..... F. H. Cheyne
Spring-seat ..... W. B. Speir
Spring trip-foot ..... J. C. Vance
Stacker, Pneumatic ..... F. L. Sattley
Steam-boiler ..... T. Barrow
Steam-boiler ..... T. F. Downey
Steam-boiler ..... T. F. Morrin, Jr.
Steam-generator ..... L. Kuehl
Steel shapes, Apparatus for altering elongated ..... J. E. York
Steel-softening composition ..... G. F. Diez
Stencil-cutting machine ..... P. J. Wolf
Sterilizing apparatus, Regenerative ..... C. W. Ramstedt
Stirrup, Safety- ..... J. G. Massie
Stone-polishing machine ..... J. Modotti et al
Stopper-retainer ..... A. E. Gordon
Store-service apparatus ..... P. Tripke
Stove-lid, Skeleton ..... J. F. Ruby
Stovepipe-lock ..... W. Hampton
Strap-fastener ..... F. A. Carlson
Sugar-beets, Treating ..... M. Weinrich
Surgical appliance ..... J. N. Alexander
Swingletree ..... W. L. Collins et al
Switchboard jack and plug ..... A. Larsson
Switch-plug ..... P. C. Eding
Switch-point-adjusting mechanism ..... F. J. Olander
Switch-stand ..... W. F. Traves
Switch-stand safety attachment ..... C. Burke et al
Table and chair, Combined ..... A. A. Trepel
Tag ..... D. P. Moore
Talking-machine ..... J. H. Mount
Tank-heater ..... W. Tinker
Tank heater, Watering- ..... C. W. Blackburn
Target ..... W. H. Green
Taximeter ..... H. Aron et al
Telegraph-circuits, Repeating mechanism for ..... J. G. Kerr
Telegraph, Electric connection for multiple wireless ..... S. Eisenstein
Telephone pay-station ..... F. X. Bee
Telephone-receiver ..... C. D. Enochs
Telephone-receiver support ..... R. Zinsmayer
Telephone signaling apparatus, Railway ..... A. A. Monson
Telephone-switchboards, Combined jack and drop for ..... C. D. Enochs
Telephone-transmitter ..... F. Gottschalk
Telescope-mount ..... G. N. Saegmuller
Temperature fluctuations, Apparatus for controlling ..... J. E. Hedin
Tent ..... L. E. Hohl et al
Thermostat ..... T. O. Edmond
Threshing-machine belt reel and guide ..... J. Bjornlie
Ticket, Transfer- ..... H. T. Steinecke
Tie-plate ..... R. Law
Tile or slab ..... W. and R. L. Smith et al
Time-controlled apparatus ..... A. Hammerstein
Tin from scrap, Removing ..... C. J. Reed
Tire and the like, Pneumatic ..... W. J. Thorold
Tire-armor ..... A. G. Thomson
Tire for vehicle-wheels, Pneumatic ..... G. W. Beldam
Tire for vehicles, Rubber ..... R. J. Evans
Tire-repair device ..... J. C. Herman
Tire, Spring- ..... L. F. Kenney
Tire, Wheel- ..... A. G. Thomson
Tobacco-moistener ..... J. C. Duncan
Tongs, Barrel- ..... S. L. Coley
Tool-holder ..... C. J. Cluley et al
Tool-retainer ..... H. A. Hillenbrand
Torpedoes simultaneously in a well, Mechanism for delivering a plurality of ..... R. S. Pringle
Toy ..... F. Meschko
Toy ..... W. P. Casteen
Track-scraper ..... A. A. De Looch
Traction device ..... J. C. Estrem
Train control, Automatic ..... S. Nydam
Train-lighting systems, Generator suspension for ..... P. Kennedy
Transmission mechanism ..... A. Pusterla
Trisodium phosphate with hydrated sodium carbonate, Manufacture of ..... W. E. Ridenour
Trolley-clamp ..... C. H. Davis
Trousers-supporting device ..... J. F. Kurtz
Truck ..... S. B. Minnieh
Truck ..... T. L. McClellan
Truck, Motor- ..... J. Taylor
Truck, Power car- ..... D. P. Sanders
Tube-forming machine, Metal- ..... J. M. Webster
Turbine-cylinder lining, Steam- ..... F. Hodgkinson
Turnbuckle, Locking- ..... W. H. Andrews
Turning irregular forms, Machine for ..... M. J. O'Donnell et al
Turning-machine head ..... W. S. Hawker
Twine-carrier ..... A. Schmid
Type-writer carriage mechanism ..... R. W. Uhlig
Type-writers, Paper-guide for ..... M. B. Sargent
Type-writing and computing machine, Combined ..... A. S. Dennis
Type-writing machine ..... J. A. Ronchetti
Type-writing machine ..... L. R. Roberts
Type-writing machine ..... E. B. Hess
Type-writing machine, &c., Coin and time controlled ..... H. Bates
Umbrella, Folding ..... C. H. Ely
Umbrella, Folding ..... F. P. Miller
Umbrella, Folding ..... R. E. Savery
Umbrella-lock ..... C. H. Sheen
Universal joint ..... C. L. Cummings
Vacuum-cleaner ..... J. C. Luden
Valve, 2 pats ..... J. A. Staples
Valve ..... O. E. Hunt
Valve ..... C. E. Drown
Valve ..... H. T. Fischer
Valve ..... E. T. Slough
Valve, Air-brake-release ..... J. A. Anthony
Valve and controlling means therefor, Pressure gas- ..... F. O. H. Fincke
Valve for air-brake mechanism, Triple ..... F. Y. Dibble
Valve-gear ..... O. R. Hukle
Valve mechanism ..... J. A. Staples
Valve, Signal- ..... C. E. Person
Valve, Temperature-controlling ..... I. W. White
Vapor-burner ..... C. E. Wirth
Vapor-extractor for use in treating whisky-barrels ..... B. H. Hubbert
Vault, Burial- ..... A. C. Bishop
Vault, Burial- ..... J. B. Murray
Vehicle-driving means, Motor- ..... K. C. Lassen
Vehicle gearing, Motor- ..... C. Schmidt
Vehicle-lock ..... D. Froehlich
Vehicle-rim ..... I. Broome
Vehicle spring-wheel ..... F. W. Margretts
Vehicle steering-wheel, Traction- ..... C. W. Hart
Vehicle storm-front ..... F. L. Moore
Vehicle-wheel ..... N. Schenk
Vending-machine ..... A. Rydquist
Vending machine, Cigar- ..... H. W. Smiley et al
Vibration-arrester ..... W. F. Nichols
Voting-machine indorsing device ..... W. J. Lausterer
Voting-machine lock-out ..... C. F. Lomb et al
Wafers, sugar-wafer biscuits, and the like, Machinery for making cup- ..... T. O. Bates
Waffle-iron ..... R. O. Bingham
Wagon loader and grader ..... F. and W. E. Hill
Wagon-seat fastener ..... P. W. Woods
Washing-machine ..... H. E. Farrar
Washing-machine ..... H. Paulus
Watch-winding machine ..... L. T. Scott
Water-current, Soil-reclaiming means for ..... J. W. Kellner
Water-purifier ..... M. B. Cresswell
Watering device, Stock- ..... F. E. Williamson
Wave-motor ..... S. Skirtun
Welding-machine ..... J. H. Taylor
Windmill-governor ..... L. M. Nelson
Window ..... E. P. Carl
Window-frame attachment ..... W. W. Lind
Window-operating mechanism ..... C. A. Washburn
Window ventilating device ..... W. B. Wilson
Window-ventilator ..... W. G. Lewis
Wire-stretcher ..... R. Ten Broeck
Wire-stretcher ..... S. B. Elder
Wire structure ..... T. G. Melish
Wrapping and labeling machine ..... T. G. McGirr
Wrapping-machine, 3 pats ..... T. G. McGirr
Yoke-tie for cattle ..... W. D. James

DESIGNS.

Badge ..... T. F. Gaynor
Caskets, coffins, or similar articles, Name-block or saddle for ..... C. F. Wetmore
Chafing-dishes, percolators, &c., Leg for ..... E. A. Gutermann
Dish or similar article, Covered ..... C. E. Haviland
Doily ..... R. Gair
Emblem ..... C. B. Hunkins
Glass spindle ..... F. J. Van Doren
Label-blank ..... S. Cohn
Letter-head ..... C. P. Bruch
Light shade, Artificial- ..... K. Booth
Phonograph-cabinet ..... T. A. Edison
Platter ..... W. E. Graves
Pocket-book ..... G. E. Avery
Refrigerator ..... H. Silver
Rug ..... F. A. Haas
Rug ..... W. A. Perry
Rug ..... J. H. Witzel
Rug ..... W. A. Spring
Rug ..... W. G. Reith
Rug ..... A. Petzold
Spoon, fork, or similar article, Handle of ..... W. C. Codman
Spoons, forks, or similar articles, Handle of ..... W. C. Codman
Wall-paper ..... E. Zilling

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MECHANICAL PATENTS.

Abdominal belt and uterine supporter ..... E. M. O'Meara
Account-cabinet ..... A. C. Machen
Acid, Making the n-propyl ester of p-amino-benzoic ..... R. Lüders
Aerating apparatus, Water- ..... G. Erlwein et al
Air-brake ..... W. B. Mann
Air brake, Combined automatic and straight ..... W. V. Turner
Air-brake governor ..... U. S. Smith
Annunciator, Indicating- ..... C. G. Behre
Anvil attachment ..... A. R. Everett
Ash-pan ..... A. Singelyn
Asphalt expansion-joint ..... C. S. McGinn
Automatic switch ..... C. D. Rolley
Automobile ..... F. P. Nehrbas
Baling-press ..... S. M. McCorkle et al
Ball-playing apparatus ..... W. Lammersen
Barber-pole ..... E. Richardson
Barrel ..... G. L. O'Brien
Barrels and casks, Device for the extraction of spirits from used ..... R. W. Nicolls et al
Battery holder, Electrical- ..... H. Engel
Bearing, Ball- ..... H. Hess
Bed-frame, Metal ..... F. B. French
Bed, Sofa- ..... S. Karpen
Bedclothes-fastener ..... L. T. Young
Bedstead ..... H. A. Sears (Reissue)
Bedstead, Metal ..... A. J. Logan et al
Beef-cooler attachment ..... J. W. Ashworth
Beer-tap ..... W. P. Mahoney
Beet-topper ..... M. Goodfellow
Bicycle-saddle ..... A. F. Lang
Binder, Loose-leaf, 2 pats ..... J. C. Dawson
Binder, Loose-leaf ..... J. L. Leslie
Blacking box and brush case ..... S. W. Mendel
Blocks and bricks, Mold for making ..... H. A. Zurbuch
Blotter, Ink- ..... O. B. Moebes
Blower, Rotary ..... P. Laut
Boat-fender ..... L. M. White
Boat-flooring ..... F. Schmidt
Boat lowering and launching means ..... J. H. Stoelt
Bobbin-spindle ..... J. A. Clark
Boiler furnace, Steam-, 2 pats ..... W. J. Ellis
Boiler furnace, Steam- ..... J. A. Forsyth
Boilers, Composition for preventing scale in ..... A. M. Urista
Bolt-anchor, Expansion ..... H. W. Pleister
Book and album, Letter ..... E. Jay
Book, Copy- ..... H. G. Carter
Boring implement ..... J. W. Riggle et al
Bottle and syringe-reservoir, Combined hot-water ..... S. L. Axford
Bottle attachment, Poison- ..... L. Inglee et al
Bottle-cap lifter ..... W. R. Clough
Bottle-capping machine ..... R. Littler
Bottle case, Milk and other ..... H. A. and H. C. Peterman
Bottle-holder ..... T. W. Green
Bottle, jar, and like cover ..... W. E. File
Bottle, Non-refillable ..... J. F. Fitzgerald
Bottle, Nursing- ..... H. D. Williams
Bottle rinser and sterilizer ..... S. R. Wood
Bottle-washing apparatus ..... C. H. Loew et al
Bottle-wrapper ..... X. Pène
Brake-beam ..... W. P. Bettendorf
Brake-beam guard ..... F. T. De Long
Brake-lever strut ..... L. Porter
Brake-operating mechanism ..... L. Courtois
Brake-shoe ..... O. A. Koenig
Bread, manufacture of, 2 pats ..... C. A. Heudebert
Brooder ..... W. Bachmann
Brush, Fountain- ..... J. Danbeck et al
Brush, Fountain marking- ..... C. W. Howe
Buckle ..... A. R. Collieutt
Buckle ..... J. F. Dunn
Buckle ..... J. M. Brown
Building-block ..... W. B. Bolles
Building foundation ..... F. Schär
Burglar-alarm ..... O. J. Burst
Burglar and fire alarm ..... B. Kohlen
Burner ..... W. W. Case
Button-assembling machine ..... E. F. T. Lundquist
Can-making machinery ..... H. C. Black
Can sifter-top ..... E. Hull
Car-door ..... W. S. Williams
Car draft appliance, Railway- ..... W. Kelso
Car draft appliance, Railway- ..... W. R. Matthews
Car draft-gear, Railway-, 2 pats ..... W. R. Matthews
Car-handling mechanism ..... A. J. Lafayette, Jr.
Car, Passenger- ..... W. S. Adams
Car-roof ..... J. Masker
Car-roof ..... P. H. Murphy
Car-roof ..... W. P. Murphy
Car-seat ..... E. G. Budd
Car-wheel, 2 pats ..... L. G. Woods
Cars, Safety device for railway- ..... J. F. Miller
Carbohydrates into hydrocarbons, Converting ..... A. Heinemann
Carboy-necks, Protective device for ..... L. Furbush
Carbureter ..... T. J. Grott
Carbureting apparatus ..... N. W. Pill
Carpet-fastener ..... F. H. West
Carriage and sled, Combined ..... W. W. Vicks
Carriage-iron ..... L. Kuchenbecker
Cast-iron pipe ..... C. R. Schmidt
Caster for operating-tables ..... A. Taubert
Casting apparatus ..... J. W. Latcher
Casting metal bars, wires, and pipes ..... F. W. Winner
Catch, Safety- ..... T. Mountford
Ceramic wares, Producing ..... E. S. Powers
Chair, 2 pats ..... A. Wanner, Jr.
Chalk-holder ..... D. W. Shepherd
Churn ..... A. Bureh
Cigar-tip cutter ..... W. R. Dutemple
Cigar-tip cutter ..... L. E. Garrigus
Clamp ..... S. H. Gensburg
Clarinet ..... F. Ramos
Clasp ..... T. Fabritius
Cleaning device, Vacuum ..... J. H. Goehst et al
Clip tie or gland puller ..... L. Hammond
Clothes-drier, 2 pats ..... F. T. Johnson
Clothes-line support ..... J. C. Michaud
Clutch mechanism ..... J. A. Talbot et al
Cock, Ball- ..... F. Muhl
Cock, Boiler blow-off ..... J. F. Zengler
Coin-controlled lock ..... W. H. Kluge
Coke-oven door ..... W. O. Abbott
Comb ..... I. E. L. Shearer
Composing-stick ..... W. U. Colthar et al
Concrete structures, Anchoring device for use in connection with ..... A. P. Lohmann
Condensing plants, Air-indicator for steam- ..... R. L. Weighton
Conduit or subway ..... W. H. Burr et al
Confection explosive shell ..... L. Braquier
Container ..... G. E. Cleveland
Conveyers, Feeder or receiving-pan for ..... G. Holmes
Cooker, Fireless ..... S. D. Baker
Cooking utensil ..... M. F. Dolan

Cooking vessel.....B. F. Ferguson
Cooking-utensil lid and cover.....E. Milholland et al
Cord-clamp.....F. C. Perrott
Core, Collapsible.....E. F. Smith
Cork and cork-puller, Combined..H. Kearney
Corn-crib.....W. B. Engel
Corner-bead fastening.....H. Zeglin
Cotton-chopper.....C. G. Hains
Cotton-chopper.....M. J. Bunnell
Cotton-chopper.....O. S. Snow
Cotton-picker.....F. M. Dannelly
Counter.....C. H. Veeder
Coupling device, Interchange....R. E. Adreon
Crate, Hog-breeding.....H. G. Carr
Cream-dipper.....A. Wilcox
Cream-separator.....G. T. Soderstrom
Cross-tie and rail-fastener.....J. L. Austin
Culvert, Corrugated sheet-metal...W. M. Lana
Curling-iron heater, Electric...C. P. Harmon
Current distributer and timer...J. M. Smith
Current-motor.....F. A. Price
Curtain-bracket.....E. A. Chamberlin
Curtain-fixture.....C. L. Hopkins
Cutting-board attachment.....L. B. Nicholson
Dental aseptic tray and stand therefor.....C. F. Booth
Dental bracket-engine.....J. F. Hammond
Deodorizing and drying nigbt-soil and the like, Means for.....E. T. Welcome
Deposit box, Safety-.....P. A. Lorenz et al
Desk, Writing and reading...H. Singenstreu
Dish, Soap-.....A. F. Riegger
Dispensing and printing machine.C. A. Alden
Display apparatus.....J. Vormbaum
Display-cabinet.....E. Moore
Display-cabinet for laces, &c.....O. A. and F. W. Hunger
Display-matter support.....T. Harrington
Display-rack.....I. W. Kennett
Display-rack for holding hats.W. R. Sandifur
Door bolt, Double-.....J. and A. Ledoux
Door-check.....J. Ewart
Door-stop.....T. A. Smith
Door-supporting device.....M. Cossey
Dough-severing device.....J. Newfield
Draft-equalizer.....F. Clark
Draft-gear.....H. C. Buhoup
Draft-gear.....C. A. Lindström
Draft-regulator.....H. B. Hemphill
Draw-bar.....J. E. Troup
Draw-bar splice.....J. A. Anderson
Drawer-locking device.....J. Bodenstein
Drier.....W. Robertson
Drills, Forming twist-.....A. Ward
Drills, Means for forming twist-....A. Ward
Driving mechanism.....H. L. Johnston
Dumb-waiter and elevator.....H. A. Smith
Dumping apparatus for pipe machinery and the like, Automatic.....W. E. Sanford
Dye, Orange to brown.....A. Blank et al
Dye, Reddish-brown cotton....A. Blank et al
Dye, Yellow to brown, 2 pats.A. Blank et al
Dynamometer.....E. A. Johnston
Electric battery.....W. Morrison
Electric device, Single-phase gas or vapor.....P. H. Thomas
Electric furnace, 5 pats.....J. Thomson
Electric furnace.....F. A. J. Fitz Gerald
Electric furnace.....J. Thomson et al
Electric beater.....M. McGerry
Electrical connection-plug.....A. N. Dods
Electrical recorder.....E. F. Northrun
Electrical testing apparatus...H. J. Blakeslee
Elevator.....C. D. Seeberger
Embossing attacbment.....F. H. Hoberg
Engine.....P. O. Poulson
Engine and tool-operating mechanism, Combined.....J. Weiner
Engine muffler, Gas-.....J. Kellington
Engine starter, Gasolene-.....E. A. Gardner
Engines, Automatic steering device for traction-.....J. R. Rogers
Engines, Automatic switch for reversing gas-.....J. M. Rhett
Ether and Alcohol, Apparatus for recovering.....C. Crepelle-Fontaine
Excavator, Drainage-.....M. G. Bunnell
Faucet attachment.....G. B. N. Dow
Faucet, Measuring and registering.....W. J. McMillan
Feed-water regulator.....F. H. Plouff
Feeder, Automatic boiler-.....C. J. Lindberg
Fence-post mold.....P. Engle
Fiber-cleaner.....H. Pettit
Fire-extinguisher.....A. Ammentorp
Firearm.....S. Paulson
Firearm, Automatic.....S. Paulson
Fireproof jewel-case.....L. Waldeck
Fishing-rod reel-clamp.....B. O. Bush
Floor-jack.....J. W. Marsh
Fluid-pressure motor and pump.....T. and W. Moss
Fly-catcher.....B. Droge
Forging-machine.....G. H. Condict
Fork.....A. O. Bonin et al
Friction feed mechanism.....M. Flather
Fruit-juices, Concentrating.....R. Dehme
Fruit-press.....S. E. Warren
Fruit-treating machine.....W. H. Noland
Fuel, Gasifying, igniting, and controlling the combustion of.....W. Remington
Furnace.....J. Thomson et al
Furnaces, Protecting registers of electric.....F. A. J. Fitz Gerald
Furniture.....E. C. R. Ellsworth
Furniture, School....J. C. and W. A. Moore
Fuse, Electric.....W. J. Lehmann
Expansible bit.....A. B. Jennings
Fan for drying and other machines, Circulating-.....C. W. Schwartz, Jr.
Farm-gate.....O. J. Wyman
Fastening device.....A. D. Field
Fastenings into work, Machine for driving..G. Goddu
Faucet.....C. Barr
Game apparatus.....J. E. Watterson
Game apparatus, Base-ball-.....W. F. Small
Garment-supporter.....S. Kops
Gas-engine.....J. Kellington
Gas-manufacturing apparatus.....H. W. Benner et al
Gases, Separating various materials from.....W. J. Baldwin
Gate-fitting.....I. L. Landis
Gate-operating mechanism.....H. L. Coats
Gear-generating machine.....J. E. Gleason
Gearing.....C. M. Rhodes
Gearing, Transmission-.....W. M. Parkinson
Gearing, Transmission-.....P. E. Clark
Gem-settings, Manufacturing strips of continuously-connected.....W. Whytock, Jr.
Girdle, Waist-.....H. W. Gilbert
Glass-molding machine.....W. J. Miller
Glass plates, Making figured and variegated..A. C. Pilkington
Graders, Dust-scraper for elevating-.....C. L. Sprague et al
Grain-binder twine-feeding device...J. Praska
Grass-burning machine.....J. R. Totman
Grate-furnace.....H. Murphy
Grinder and pulper, Adjustable stock power..J. Sieffert
Grinder, Lawn-mower.....P. H. Root
Grinding-mill.....L. E. Simpson
Grinding-mill.....J. Walker
Hair-curler.....S. A. Fisher
Hammers, Tool-holder for pneumatic.....V. E. Lane
Harvester, Corn-.....C. A. Patton
Hay-fork.....E. Swan
Hay-loader coupling.....W. Bishop
Hay or stevedore's hook.....H. Abernetby
Head-rest, Sanitary.....E. E. Koken
Heating apparatus.....L. V. Driessche
Heating device.....C. Forth
Heel, Detachable sboe-.....F. G. McCollum
Heliograph.....T. J. Maher
Hide and other material working machine....E. A. Fisher et al
Hinge, Gravitating.....J. Kunzmann et al
Hitch-strap.....R. Bellamy
Humidor.....J. J. Deeming
Hypodermic needle.....P. J. McElroy
Hypsometer.....F. G. Plummer
Ice-cream freezers, Securing device for.....J. G. Kirkpatrick
Ice-cutting machine.....P. Susol
Induction-furnace.....P. Gredt
Injector.....W. T. Strain et al
Injector, Spiral-jet.....G. C. McFarlane
Insulating means; Producing transparent, flexible and infusible.....K. Winkler
Internal-combustion engine...O. A. Stranahan
Ironing-machine.....G. H. Wade
Jarring-machine.....P. J. Conboy et al
Journal-box.....T. R. McKnight
Knitted fabric.....B. T. Steber
Knitting-machine stop-motion.....F. J. Heady
Knob attachment.....E. L. Teich
Ladder.....L. M. Norton
Ladder, Folding.....M. Barth
Ladder, Loose-link.....J. H. Scribner
Ladder, Wire.....J. Ross et al
Lamp, Alcohol-.....J. H. Seaman
Lamp, Electric mercury arc-.....J. M. Anck
Lamp for liquid combustibles, Inverted incandescent.....A. Glinicke et al
Lamp, Gas-.....A. H. Pumphrey
Lamp-holding device.....R. B. Benjamin
Lamp, Reflecting-.....W. S. Perry
Lamp-socket, Cluster, 2 pats.R. B. Benjamin
Lamp-socket, Plural.....R. B. Benjamin
Lamps, Automatic controlling device for vehicle-.....H. Ehlen et al
Latch, Compound double automatic.....F. C. Anderson
Lead sulfate from impure sulfate, Preparing pure.....A. S. Ramage
Line-holder.....E. O'Brien
Lineograph.....T. E. Ford
Liquid-meter.....C. W. Meek
Liquor-gaging apparatus.....J. Seitz
Liquors, Manufacture of fermented..O. Huber
Loading apparatus.....J. M. Caraway
Lock, 2 pats.....H. F. Keil
Locomotive, Internal-combustion..A. H. Ehle
Loom braking device.....A. E. Healey
Loom-snuttle-changing mechanism.....M. and R. Lemarchand et al
Loom stop-motion.....A. A. Gordon, Jr.
Magnet, Lifting-.....A. C. Eastwood
Mail-bag catcher.....J. A. Schinner
Mail-bag catching and delivering apparatus..W. H. Storne
Mail-box.....M. Kilian
Mail-delivering apparatus, Automatic.....L. Becker
Mail-marking machine...T. G. Stoddard et al
Mantles, Manufacturing incandescent.....H. Süssmann
Manure-spreader.....W. N. and W. N. Whitely, Jr.
Match-safe, Pocket.....J. A. Burr
Measuring instrument, Electrical.....E. F. Northrup
Measuring instrument, Electrical.....M. J. Wohl et al
Measuring-line, Surveyor's.....T. H. Tracy
Meat and bone cutting machine.....C. D. Nolan et al
Mechanical players, Operating mechanism for.....W. F. Cooper
Metallic sheathing.....S. W. Banning
Milk and cream tester.....H. C. Berry
Milk-bottles and the like, Receptacle for....J. M. Brussau
Mold.....T. MacDougal et al
Molding-machine.....H. E. Pridmore
Monolithic construction.....E. Sobel et al
Mop and brush holder.....F. Dehling
Mop-wringer.....J. L. Simmons
Motion-converting mechanism.J. S. Watterson
Motors, Power-transmitting mechanism for wind-.....F. Hannaman
Muff, bag, and purse, Combination.....A. S. Miller
Nail-making machine.....W. Offermanns
Nebulizer.....B. E. Baker
Nest, Trap-.....F. J. Schisler
Nippers and pincers.....E. Jones
Nitrogen from the air, Apparatus for producing oxids of.....F. I. du Pont
Nozzle, Boiler-tube-cleaner....R. W. Hamann
Nursery-seat.....M. A. W. Redmond
Nut-cutter.....A. Loock
Nut-lock.....C. C. Blossom
Nut-lock.....R. Keegan
Oil decoloring bleaching, and thickening apparatus.....J. C. L. Vander Lande
Oiling device.....W. W. Nugent
Ointment, Opium.....T. M. Cadenhead
Ore, sintering.....G. G. Vivian
Ores, Reducing metallic oxid.....H. E. T. Haultain
Outlet-box.....A. I. Appleton et al
Packing.....D. F. Stayman
Paper-clip.....A. W. Brown
Paper-feeder, Automatic.....J. Hren
Paper-pulp-refining engine....W. H. Sanburn
Paper-pulp screen.....H. E. Spring et al
Paper strips or the like, Positive feeding device for.....O. Oehring
Paper-trimming machine, Wall-.....H. L. Selleneit
Pen, Fountain-.....W. I. Ferris
Pen, Fountain-.....C. E. Martling et al
Pens, Feed-valve action for fountain-.....G. H. Heindselman
Pencil-sharpener.....C. C. Spengler
Photograph-printing machine.....J. H. Cook
Photographic plates or flat films, Packing for.....M. Romanowicz
Piano without strings.....M. Noeth
Piling.....E. A. Bern
Pin.....E. R. Crecelius
Pipe and tile mold.....G. Kesling
Pipe-coupling.....C. Forth
Pipe coupling, Air-.....W. J. Ellis
Pipe-hanger.....E. Williams
Piston, Water-meter.....J. C. Kelley
Planter.....C. Reutzel et al
Planter, Wireless Corn-.....J. Stickley
Plate-holder.....L. J. Vough
Plating-tanks, Apparatus for circulating the liquid in.....G. L. Wallace
Plating tubes, &c.....W. H. Winslow
Plow.....T. Parks et al
Plow-jointer.....L. E. Kieffer
Plow, Traction-engine gang-....J. W. Jackson
Plows, Combined packer and harrow attachment for sulky-.....R. R. Markle
Plows, Subsoil-cultivator attachment for.....R. M. Kemp
Pneumatic cleaning system.....G. J. and A. W. Kindel
Pocket-book or purse.....O. A. De Long
Post-card holder.....C. Ewing
Powder-distributer.....C. H. Leggett
Powder, Producing an amorphous tungsten..J. Schilling
Press.....A. Bates
Presses, Attachment for hydraulic wheel-....M. M. Moran
Printing and developing apparatus.....G. C. Beidler
Printing-plate, 2 pats.....J. S. Duncan
Projectile, Capped armor-piercing.....C. V. Wheeler et al
Propeller.....J. C. Boyd
Propeller-wheel.....C. T. Woodburn
Pulling-over machine.....R. F. McFeely
Pump.....I. R. Stout
Pump.....T. J. Johnson
Pump attachment.....E. J. Barber
Pump for wine and similar liquids..M. Ley
Pump-governor, Electric.....W. V. Turner
Pump, Hand-.....H. J. Kurrus
Pump, Screw.....E. S. Bennett
Pump, Screw-.....E. S. Bennett
Punches, dies, and other articles, Machine for manufacturing.....G. Korinek
Puzzle, Picture-.....R. T. Peckham
Rack or hanger for pipes, poles, rods, and other objects.....A. Seidel
Radiator-hanger.....A. Seidel
Rail-bonding apparatus.....O. L. Cadle
Rail-bonding apparatus, Portable..W. A. Neff
Rail-fastener for metallic ties..M. F. Bowser
Rail-joint.....B. Wolhaupter
Rail-joint.....J. H. Hayes
Rail-joint.....H. H. Julick
Rail-joint, Compromise.....V. C. Armstrong
Rails, Bonding.....C. L. Cadle
Railway-gate, Automatic.....J. W. Morrow
Railway-rail support, Concrete....W. Laudahn
Railway-signal, Electric.W. Kirkpatrick et al
Railway-switch.....R. E. Garverich
Railway-switch lock.....F. C. Brown
Railway-tie.....A. S. Topping
Railway-tie, Steel combination.....J. R. Green (Reissue)
Railway-track construction.....W. Worwood
Railway-track layer.....R. L. Brown et al
Rain and wind shield, Combined.....C. F. Baker et al
Rake.....J. N. Parker
Ratchet-wrench.....S. P. Perussina
Razor-hone.....S. J. Smith
Razor, Safety-.....A. Hygonnet
Razor, Safety-.....J. K. Waterman
Razor-strop.....A. L. Silberstein
Razor-stropping machine, 3 pats.M. H. Avram
Receptacle-closure.....R. G. Adams
Reel for ruchings and the like.....R. H. Hunt et al
Refrigerating plants, Ammonia-purifier for...F. Nenzei
Refrigerator.....W. C. Coleman
Refrigerator.....G. C. Bohn
Refrigerator.....A. K. Cross
Register.....S. W. Potts
Resilient wheel.....H. H. Browne et al
Respirator and the like....J. Eriksson et al
Rifles, Stock-magazine for single-shot.....W. J. Rodgers
Rolling disks, machinery for cold-..A. L. Dow
Rolling-pin.....R. M. Vick
Rolling tubes, solid round bars, and similar bodies, Process of and apparatus for.....R. C. Stiefel
Roost, Bat-.....C. A. R. Campbell
Rotary engine.....T. Duvsens et al
Rotary engine.....E. and T. Erickson
Sad-iron, Self-heating....J. McGonegal et al
Saddles, Thigh-pad for.....J. Reisacher
Safety-can.....J. S. Lang
Sash-center.....P. F. Augenbraum
Sash-cords to weights, Device for feeding.....J. W. Green
Sash-holder.....C. Hiatt et al
Saw-guard.....C. H. Burbank
Scale, Take-up.....J. J. Killars
Screen.....H. Higgen
Screw-driving machine.....W. P. Hunt
Screen and storm door, Combination.....C. Bauer
Seal, Car-.....E. C. Yeoman
Section-breaker.....H. E. Hale
Sectional boiler and furnace, Combined.....M. C. Hall
Seed packer, Cotton-.....J. Broussard
Seeder.....J. L. Hicks
Separating-screen.....G. C. Keller
Sewing machine, Shoe-.....A. Eppler
Shade adjuster, Window-.....F. C. Perrott
Shaping machine, Traverse head-.....A. R. Murray
Sharpening and grinding tool.E. C. Hawkins
Sharpening implement.....G. B. N. Dow
Shingle-machine.....H. M. Lofton
Ship construction.....A. L. Mobley
Shock-absorber.....J. M. Gibson
Shoe-fastening device.....O. Nelson
Signal.....C. P. Ruggles
Signal.....E. G. Reed
Sink-leg.....G. G. Firth
Slicer, Meat-.....T. C. Brasket
Snap-hook, Safety.....R. Anteau
Snow-melting machine.....H. F. Cuntz
Soap shaving or granulating device.....J. N. Riggs
Spark-plug.....S. B. Fowler
Speedometer.....L. E. Blanchard
Spike clamp and fastener.....H. O. Crippen
Spinning and twisting device, Yarn.....V. Bélanger
Splice-bar.....T. C. Lackland
Sprayer, Tree-.....F. G. Hayes
Spreading-machine.....I. C. Fielden
Spring-check.....B. B. Mears
Spring-wheel.....A. R. Miskin
Stack-cover.....I. C. and W. W. Van Dusen
Stapling-machine.....J. Shields et al
Steam-engine.....E. Garst
Steam-trap.....W. O. Wheeler
Steam-trap.....G. C. Ellerton
Steering-gear.....W. E. Geyer
Stencil.....W. Krug
Sterilizer and water-heater.....A. R. Talbott
Stove, Fluid-vapor.....J. W. Chapman
Stove lighter, Gas.....O. H. P. Clark
Stove top, Cooking-.....F. Ziganek
Stoves, Checker-brick for hot-blast.....D. D. Lamond
Straight-edge.....L. R. Herman
Strainer, Hose-pipe.....I. Brindle
Strainer, Sink-.....J. Morgan
Strainer, Tea or coffee.....N. Barstow
Stropping-roller.....M. H. Avram
Supporter.....M. M. Buchbolz et al
Swimming device.....E. Eastman
Swing.....G. E. Knowlton
Swing.....R. W. Easton et al
Table.....J. B. Baum
Tags, Machine for cording shipping-.....I. L. Hammond
Taximeter.....J. W. Jones
Teapot.....C. G. Shope
Telegraph bulletin-printer.G. L. Campbell et al
Telephone apparatus.....D. H. Wilson
Telephone desk-set.....B. W. Sweet
Telephone-muffler.....W. D. Plumb
Telephone system.....W. W. Dean
Telepbones, Disinfectant device for.....A. W. Lyda et al
Tenpin-ball.....M. Cavanagh
Theatrical appliance.....H. Rochez
Thermostat-adjuster, Automatic...J. W. Frost
Thill-coupling.....F. A. Strodel
Theard-cutting tool, Taper-.....B. Borden
Three-horse evener.....T. S. Moffett
Timepiece winding mechanism, Electric.....J. Steiger et al
Time-recorder.....M. H. Avram
Tin and sheet bar heater.....C. Hillman
Tire.....R. and S. Basch
Tire, Armored vehicle-.....M. L. Williams
Tire for vehicle-wheels, Cushion-.W. E. Budd
Tobacco-pipe.....F. W. Smith
Torpedoes, Air-heater for automobile.....F. M. Leavitt
Toy, Walking.....T. A. Killman
Track-gage.....E. W. Fordyce
Track-sander.....W. J. Beattie et al
Track-sanding device.....J. Gapp
Transferring device....W. E. Rennells et al
Transmission mechanism.....A. Winton
Trolley-pole.....H. Brod
Truck, Car-.....W. L. Austin
Tubes from metal strips, Machine for manufacturing.....P. Schmale
Tubing and casing hook.....L. C. Sands
Tumbler-lock, Master-key.....J. Roche
Turbines, Blading for elastic-fluid, 2 pats.....J. S. Green
Tweezers.....E. C. Wells
Type-writer-carriage escapement.....F. Alexander
Type-writing machine.....H. H. Steele
Type-writing machine.....F. A. Cook
Type-writing-machine type-bar..A. Schneeloch
Umbrella rib and stretcher joint.....M. H. Hartzell
Urinal-stall.....D. J. Cable
Vacuum-producing apparatus....L. W. Serrell
Vacuum-tube, Monopolar.....F. A. Davis
Valve.....R. I. Hilliard
Valve.....W. Volkhardt
Valve, Air-.....F. H. Sauer
Valve-cage seats, Machine for grinding.....F. W. Cooke
Valve mechanism for fluid-engines.....H. H. Van Winkle et al
Vapor apparatus, Starting device for adjustable.....P. H. Thomas
Vault, Burial-.....J. C. Snyder
Vehicle driving mechanism, Motor-.....A. Winton et al
Vehicle, Motor-.....G. Provot
Vehicles, Wind-shield for self-propelled.....W. Kerr (Reissue)
Vending apparatus, Coin-controlled.....L. L. Martin
Ventilator.....E. D. Chadwick
Ventilator.....L. J. Carney
Vessel, Double-walled.....G. R. Paalen
Vines and other climbing plants, Appliance for training pea-.....L. Petzler
Violin-supporter.....H. A. Smith
Wagon-hood, Collapsible.....C. C. Cooper

Wagon-jack....A. A. Coon
Wall construction, 2 pats....G. W. Lambert
Washboiler attachment....E. M. Worden
Washing-machine....J. H. Ostertag
Washing-machine....S. S. Blocher
Washing-machine driving mechanism....D. O. Makean
Watches and watch-clocks, Self-mounting case for....E. Hart
Water elevator and distributer..R. L. Sanders
Water-heater....E. W. Sawtelle
Water-meter....W. H. Sitts
Weed-cutter....E. Laas
Weighing-machine....J. T. F. Conti
Welding the meeting edges of metallic articles, Apparatus for....F. C. Sanford et al
Wheel link, Spring-controlled vehicle-, 2 pats....H. Ewing
Whiting, Manufacturing....W. Nelan
Window-cleaning device....E. H. Brown
Window-frame....J. Herrmann
Window frame and sash....F. J. Fischer
Window-screen....J. H. Chamberlin
Wire-rope clamp....C. A. McCarthy
Wire-stretcher....R. Whitlock
Wireless communication, Detector for....J. L. Hogan, Jr.
Wrench, 2 pats....H. H. Warner
Wrench....J. F. Pontius
Wrench....S. C. Clark
Yoke center, Neck-....J. C. Wise

DESIGNS.

Dish or covered article....C. Ziegler
Fountain, Liquid-dispensing....F. W. Calvert
Lamp-shade....H. S. Evans
Lamp-shade....L. W. Young
Piano-casing....T. P. Brown
Picture-frame....C. A. Carlson
Spoon, fork, or similar article....H. Hillbom
Spoon or similar article....W. A. Jameson

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MECHANICAL PATENTS.

Abdominal-fat-reducing appliance....A. M. Loughney
Account-register..A. F. Staples et al (Reissue)
Advertising device....R. Wightman
Advertising device, Motion....A. H. Douglas
Aeroplane....H. F. Weidel
Aeroplane, Monoplane....R. W. Stewart
Air and steam connection, Automatic....H. L. Miner
Air-brakes, Pressure-retaining device for....J. C. Huxhold
Alcohol and other volatile substances from empty barrels, casks, &c., Recovering....W. Miller
Alcohol from the lining of barrels, &c., Apparatus for recovering....J. J. Gilchrist
Annealing-box....J. E. Bossingham
Aspirator....I. Steiner
Automatic sprinkler....G. I. Rockwood
Automobile-fender....J. E. Bennett
Automobile-starter....C. A. Smith
Ball-bearing shears....D. A. Mickleson
Banjo attachment....G. M. Spencer
Barometers, Setting of....J. B. Mitchell
Barrel-washing machine....J. Müller
Barrels, casks, &c., Recovering soakage from....W. Miller
Basket, Hanging....J. E. Gillespie
Bath-tub, Folding....L. F. O'Neill
Battery-well....C. F. Massey
Bearing, Adjustable ball-....L. Mau
Bearing, Ball-....H. Hess
Bearing for twister spool-spindles....A. E. Rhoades
Bearing, Roller-....G. J. S. Collins
Bearing, Roller-....G. Rennerfelt
Bed, Adjustable....L. J. Gronde
Bed-cover support....E. D. Peerstone
Bed, Sofa-....S. Karpen
Beds, Spring-frame for....J. W. Richardson
Bicycles, Crank-shaft and crank-shaft bearing for....W. L. Lowrence
Billiard-cue....C. Ransom
Billiard-table cushion....G. Victor
Binder, Loose-leaf....M. C. Neuner
Blower....M. A. O'Connor
Book-holder....A. Peterson
Bookbinding....C. R. Duryea
Bottle, Non-refillable....L. J. Loeffelman
Bottle, Nursing-....C. P. Eberley
Bottle-rinsing machine....S. Volz
Bottle-stopper....K. Haugeland
Bottle-stoppers, Device for seating rings of easily-breakable material on....R. Veeck
Box structure....C. W. Lewis
Brake-lever strut, 2 pats..C. H. Williams, Jr.
Brake-shoe....H. H. Urquhart
Brake slack-adjuster, Car-....W. K. Price
Bridge, Pontoon-....A. Norman
Briqueting-machine....G. W. Rigby
Brush....J. F. Bowditch
Bucket, Sewer-....A. W. Shirk
Buckle, Tug-....C. C. De Witt et al
Building-walls, Machine for pointing....C. Hansson
Burial casing or vault, Metallic..H. D. Clark
Burrowing-pest destroyer....T. G. Hitt
Buttonhole device....K. Gorman
Cable-carrier apparatus....J. A. Pitt
Cable conductor, Identifiable....A. B. Porter
Cable-terminal....F. G. Jones
Calculating and listing machines, Automatic check-handling attachment for....A. S. McCaskey
Calorimeter....A. H. Walrath
Can-cover-locking device, Milk-....H. M. F. Leighty
Cans and the like, Aerating-cover for milk-....S. Shapiro
Candlestick, Miner's....J. J. Cluin
Cane-stripper....F. J. Dresia
Car-bridge....C. W. Welch et al
Car-coupling....R. E. L. Janney
Car, Dumping-....C. R. Whipple
Car-fender....I. H. Caliga
Car-fender....J. T. Carraher
Car, Funeral....S. W. Mather
Car-replacer....A. C. Kelley
Car, Street-....H. M. Sloan
Car, Tank-....M. A. Garrett
Car view-box....C. E. Crane
Carbureter....G. W. Brown
Carbureter....W. D. French
Card indicator, Continuous-....A. P. Kinney
Carriage-tops, Resilient support for....C. L. Barnum
Cash-register, 3 pats....T. Carroll
Caster-wheel....G. M. Williams et al
Casting apparatus....D. W. Blair et al
Catamenial bandage....M. M. Gillam
Catching and holding device..W. B. Armstrong
Ceiling construction, Metal-....P. Ebner
Cement, Bituminous....J. H. Amies
Cement-block-making machine....B. L. Blair
Cement or concrete, Mold for forming walls or buildings of....C. P. Hockett
Centrifugal apparatus for compressing and propelling fluids....C. Wedekind
Centrifugal separator....P. M. Sharples
Chain-clip, drive-....W. J. Blecher
Chair attachment....D. McGenniss
Chimney or flue ventilator....S. H. Millman
Chiropodist's knife....A. Eskridge
Chuck, Automatic....T. R. Huling et al
Churn....P. B. Southworth
Cigar-box....T. E. Fearon
Cigar-cutter....E. Walker
Cigar-tip coating....C. Schroeder et al
Cigarette-case....J. Chatellier
Circuit-changer....P. J. Doyle
Cistern....C. Fisher
Clasp....H. Strasburg et al
Clock, Electric call-....O. P. Ragan
Closet....A. D. Fuller
Clothes-line....A. Goff
Clothes-pin....W. C. Kitts
Clutch, Friction-....C. M. L. Moseson
Clutch, Friction-....V. M. Moore
Cock, Ball-....F. Biedenmeister
Coffee-urn....E. N. Bachelder
Coin-controlled mechanism....I. O. Carlson
Coking process....L. L. Summers
Collar and lapel for ready-made garments, Adjustable....A. C. Herzberg
Collar-blanks, Flexible die for forming....J. W. Condon
Collar, Horse-....E. T. Whiting
Collar-pad....J. H. Wolf
Combustion-engine....C. E. Henriod
Commutator-motor, Single-phase....E. F. W. Alexanderson
Composing-machines, Magazine of typographical....J. G. Holbourns et al
Compression stop and waste..A. C. Schuermann
Concrete-block-molding machine....J. W. Bragstad
Concrete, Form for....A. Lanquist
Concrete-reinforcing unit....S. B. Russell
Condenser, Electro-adjustable....H. Gernsback
Continuous kiln....W. H. Smith
Convertible chair....Z. B. Csiky et al
Conveyer....C. D. Seeberger
Conveyer mechanism....J. Mussell
Conveyer system....C. D. Seeberger
Cooker, Steam-....J. C. Prims
Cooking utensil....H. M. Taylor
Copy-holder....B. F. Peetz
Corset....H. C. Bayer
Cotton-chopper....J. W. Martin
Cotton-press....F. F. Breihan
Cotton-separator....W. A. Patterson
Crane, Luffing-....R. Carey
Cue....H. McCleary
Cultivator....S. A. Bond
Cultivator and attachment....R. D. Elliott
Culvert, Cement....C. A. Van Riper
Culvert, Flat-bottom....J. B. Jarmin
Culvert-pipe, Metal....J. B. Jarmin
Culvert, Round....J. B. Jarmin
Current-motor....F. H. Crago
Curtain bracket, Window-....Z. J. Robert
Curtain-fixture, Adjustable....H. L. Saucier
Curtain-pole and shade-roller supporting bracket, Combined....J. Svanda
Cuspidor-cleaner....N. and C. Caruso
Cuspidor for railway-cars, Sanitary....J. L. Oglebay
Cutting mechanism....E. P. Sheldon
Dampening-machine....T. F. Minahan
Dandelion-killer....J. S. Foulke et al
Dental inlays, Apparatus for casting....C. L. Kemery
Desiccating apparatus....H. J. and S. C. Keith, Jr.
Desk, School-....G. H. Parker
Display-case, Revoluble....B. Swan
Display device....J. A. Arnsdorff
Display device....E. R. Phelps
Display frame and easel....J. P. Tracy
Displaying advertisements, Apparatus for....G. H. Thomas
Displaying device, Merchandise-....**G. J. Bicknell et al**
Door-check....T. J. Younglove
Door-controlling apparatus....H. G. Voight
Door, Grain-....J. A. King
Door-hanger....V. Cheney
Door plates or signs, Apparatus for manufacturing....C. Simmang, Jr.
Door stop and releasing device...T. P. Shean
Doubletree....W. E. Woods
Draft-equalizer....B. J. Brunke
Draft-regulator....A. Trarbaugh
Draft-rigging, 2 pats....C. Metterhausen
Drawer attachment....F. E. Schultz
Drawing circles, Instrument for....J. H. McMurray
Dredging-machine....N. B. Broward
Drilling-machine....R. L. Wilcox
Driving-gear, Chain....R. H. Bowman
Drying apparatus....J. H. Duncan
Dust-receptacle....J. S. Thurman
Educational appliance....H. Hanstein
Electric cut-out....T. E. Murray
Electric furnace and operating same....J. F. Shawhan
Electric lighter....W. Voltz
Electric snap-switch....G. E. Stevens
Electric-circuit protector....C. A. Rolfe
Electrical test implement....V. H. Dake
Electrode-box for liquid-purifying apparatus..H. B. Hartman
Electrolytic cell....J. Whiting
Electroplating-barrel apparatus....T. A. Smith et al
Electroplating pipe, &c., Means for....L. A. Williams
Embossing and printing press..E. M. Lockwood
Embroidery-hoop....W. F. Mintel
Engraver's tool....A. S. Koch
Eraser-cleaner....E. A. Robinson
Evaporating solutions....O. Mantius
Expanding die or stamp....D. Berlizheimer
Explosive compound....H. Maxim
Explosive-engine....G. J. Weber
Explosive-engine....G. W. Smith
Eye-shield....F. O. Ellis
Eyeglasses....J. Friedlander (Reissue)
Eyeglasses....A. Wiltz
Fabric and knitting the same, Checkered plated....E. A. Hirner
Fan and whip, Combined....M. Forst
Faucet....R. G. Cator
Fertilizer-distributer....O. O. Newberry
Fertilizer-distributer....F. A. Preuss
Fibers from vegetable tissues, Extracting....M. R. Kennedy
Filling and crowning machine....L. Litty
Fire-alarm signal, Automatic....F. E. Schultz
Fire-escapes, &c., Rope-gripping device for....O. Sorenson
Fire-extinguisher, Air-operated...P. L. Wilbur
Firearm-magazine fastener....J. D. Pedersen
Fireproof wall....D. Dunlevy
Fish-screen....W. B. Erekson
Fishing-rod reel-holder....F. H. Haskell
Floor-board press....W. Bruhn
Flour-bleaches, Applying....J. A. Wesener
Fluid-pressure regulator....E. J. Rohrbacher
Flushing-tank....W. C. Eakin et al
Flying-machine....L. C. Kincannon
Foot, Artificial....J. F. Rowley
Former....C. E. Taylor
Foundry plant....A. R. Price
Fruit-cutter....F. Hampel
Fume-arrester....H. Howard (Reissue)
Furnace-charging apparatus....A. C. Clark
Furnace-cooling jacket....J. Lawson
Furnaces, Charging blast-..T. McDonald et al
Fuse block, Multiple-....C. H. Dunfee
Game....L. H. Gilbert
Game apparatus....R. O. Rohlin
Game apparatus, Base-ball-....P. C. Peuser
Game apparatus, Base-ball-....J. F. Murray
Game-counter....J. H. Lesher
Garment-hanger....F. Wolf
Garment-holder....B. J. Buckingham
Garment-supporter attachment...J. S. Martin
Gas and analogous gases for obtaining tar and ammonia, Treatment of coal-....W. Feld
Gas apparatus, Combined dip-regulator and tar-seal for....J. Dell
Gas apparatus, Oil-....E. N. Percy
Gas-engine....G. W. Weller
Gas-generator....E. E. Hancock et al
Gas generator, Acetylene-..R. B. Alison et al
Gas-producers, Feeding mechanism for....J. C. and J. A. Swindell
Gaskets, Retaining-spring for....J. E. Ward
Gear-wheel....A. Johnston
Glass-drawing machine, Window-....C. M. Resslar
Golf-bag....G. A. O'Neil
Golf-ball....M. M. Dessau
Golf, Portable apparatus for use in playing clock-....J. H. Matthews
Grain-drill....C. A. Pattison et al
Grain-drill....W. Fetzer
Grain-germinating apparatus....L. Mueller
Grain polisher and cleaner....I. Steiner
Grate deflector, Gas-....J. C. Calhoun
Grate, Fire-....J. H. and A. N. Spangelo
Grinding and polishing skate-runners, Apparatus or machine for....F. H. Koerner
Grindstone-frame....T. C. Prouty
Guaiacol and making same, Compound of....F. Elger
Gun-barrel....S. Faber
Hatter-tie....O. P. Marth
Hammer tools, Rotation device for fluid-pressure-operated-....A. H. Taylor
Harrow....C. E. White
Harrow....J. Wilding
Harvester, Beet-....J. A. King
Harvester, Corn-....I. L. Dawson
Harvester, Stalk-....J. B. Schuman
Harvesting machine, Cotton-....H. B. Morris
Hat-rack....R. Bratton
Hay rake and buncher, Revolving....C. M. Borland
Heater....J. F. Cottrell
Heating apparatus, Downdraft..H. D. Sawyer
Heating, cooling and ventilating apparatus....J. Keith
Heddle-making machine....A. B. Kasparson
High-power boiler..L. M. G. Delaunay-Belleville
Hinge....C. C. Meyer
Hinge, Spring-....G. C. Jenner
Hook and eye....P. Altman et al
Horseshoe-pad....C. E. Pearl
Horseshoe safety attachment....R. J. Kleiser
Hose-coupling....P. Krischer
Hose-coupling....J. H. Stephens
Hose-protector....R. D. Weakley
Human bodies, Instrument for determining the position of an organ or the like within....J. Gillet (Reissue)
Ice-cream spoon....D. H. Mosteller
Igniting apparatus....D. S. Cole
Inkstand....J. B. Nixon
Insect-trap....J. W. Malphurs
Insulating-tube....T. T. Mather
Insulator, Strain-....M. M. Wood
Internal-combustion engine....A. Duffy
Internal-combustion engine....G. J. Loomis
Iron heater and cover....W. Kretzmann
Ironing-board....M. M. Kane
Ironing-table....B. Warshaw
Jar-cap wrench....E. Smith
Jar-holder....E. Smith
Jeweler's bench....W. J. Meyer
Joint, Waterproofing-shield for expansion-....T. A. Schaffer
Kaleidoscope....S. Jenkins
Kilns, Apparatus for utilizing the waste heat of....H. G. Layng
Knitting machine, Rib-....R. W. Scott
Knitting-machine stop-motion....G. L. Ballard
Knob attachment....W. K. Henry
Labeling-machine....F. W. Wild, Jr.
Ladder, Step-....W. R. Mathes
Lamp-filament support, Incandescent-....A. S. Knight
Lamp filaments, Forming elastic anchors for incandescent-....H. W. Bresler
Lamp-shade holder....J. Cruikshank
Lamp socket, Incandescent-electric-....J. J. Rooney
Lantern....E. C. Everett
Lantern, Convertible projection-....C. F. Dutton, Jr.
Lantern, Railway-....W. R. Lawson et al
Lantern slide-holder, Projection-....C. F. Dutton, Jr.
Lap-link....J. B. Menard
Latch, Gate-....W. J. Fuston
Lavatory....E. G. Watrous
Lawn-edger....F. J. Randall
Leaching-vat....W. H. Teas
Lever, Uncoupling-....W. P. Murphy
Lightning-protector for buildings....J. P. A. Anderson
Line-casting machine....J. McNamara
Liner, Sectional....J. Baum, Jr.
Liquid-purifying apparatus, Current reversing and control mechanism for..H. B. Hartman
Liquid-separator, Centrifugal...C. H. Hackett
Loading apparatus....J. C. Clark
Lock....H. F. Keil
Locks, Seal-holding mechanism for....C. H. Johnson
Locomotive....C. E. Davis (Reissue)
Log hauling and loading machine..W. Dequede
Log-hook....M. E. Spears
Loom, Circular, 3 pats....A. Petersen
Loom shuttle, Weft-replenishing-..E. H. Ryon
Loom warp stop-motion....J. Regan
Loom, Weft-replenishing....S. S. Jackson
Loom, Weft-replenishing....E. H. Ryon
Looms, Stretching and equalizing roll for....C. Kromer
Lubricator....F. M. Cannon
Machine-tools, Automatic feeding mechanism for....G. Worton
Mail-chutes, Collection-box for....R. E. Edwards
Mail-receiving apertures, Closure for....L. Ehrlich
Mailing tube or wrapper....H. L. Greve
Mantle, Incandescent....M. Weickert
Marker, Land-....J. G. Byron
Match-making machine....S. E. Rahe
Mattress, Spring-....S. P. Etter
Measuring and assorting balls, Machine for..H. McCormack
Measuring flowing water, Apparatus for....W. A. Buis
Metal-polishing compound....W. Brenton
Metal seat and the like....H. U. Hart
Metallic article, Coated....W. C. Robinson
Meters, Nutating disk for....A. G. Holmes
Meters, Volume-recording attachment for fluid-....H. P. Westcott
Milking-machine....F. A. Lane
Mill screen or shoe, Fanning-....J. N. Osborn
Minnow-trap....S. S. Todd
Minnow-trap....H. S. Newberry
Mixing-machine....T. L. Smith
Mold....N. R. Lee
Mold....W. E. Anderson
Mold for chilled rolls....F. E. Mesta
Molder's flask....J. Jordan et al
Molding apparatus....W. H. Hofmann
Molding-board....J. S. McQuinn
Molding-machine....A. J. Rioux
Monoline-machine....J. McNamara
Motive-power apparatus....C. H. Atkins
Music rack and support....H. L. Freeman
Musical garden ornament....A. S. Jakobson
Nail-holder....I. D. Lambert
Noodle-cutting device....S. M. Ohmart
Nose-bag....H. Zwieger
Nut-lock....F. Bushey
Nut-locking device for rail-joints....A. D. Simpson
Oar, Bow-facing self-feathering..J. H. Stewart
Oar-lock, Safety....E. Z. Griggs
Oil-burner....A. E. Hauck
Oil-burner....W. R. Jeavons
Oil-burner, Crude-....J. A. Brabham
Operating-tables, Attachment for physicians'..F. N. Solsem
Ore-treating apparatus....W. G. Perkins et al
Ores, Agitating apparatus for the treatment of....J. E. Rothwell et al
Ores, Process of and apparatus for treating..W. G. Perkins et al
Otacoustic....E. May
Ozonizer....O. Linder
Packing....H. Brousseau
Packing for pistons and the like....A. Pearse, Jr.
Packing-ring for shaftings..C. G. Cunningham
Packing, Shaft-....W. Kieser
Paint and varnish remover....P. J. Geller
Painting-machine....P. R. Buchwald
Paper-making machine....H. Gaara
Paper or the like, Production of metallic....S. O. Cowper-Coles
Papering apparatus, Wall-..C. E. Hamelstrom
Paraffining-machine....J. C. Thompson
Pencil-sharpener....H. J. Schuch
Percolating device....G. E. Savage
Percolator....O. Selg
Petroleum products, Apparatus for use in obtaining....H. Frasch
Petroleum products, Obtaining....H. Frasch
Phonograms, Duplicating....F. W. Matthews
Phonograph....F. L. Dyer
Phonograph-reproducer....P. Weber
Phonograph-reproducer....R. Head
Phosphate-mill....W. F. Duncker
Piano....H. S. Hornbeck
Piano-casing....F. Renek
Piano pedal-action....E. D. St. John
Pie-filling composition, Making..E. J. Mar Lett
Pile....L. E. Welsh
Pipe-coupling....C. R. Schmidt
Pipe-covering....**W. Sherwood**
Pipe-pulling machine....C. D. Shorts
Pipe-wrench....W. S. Miehle
Pitchfork....H. D. O'Connor
Plane, Block-....W. H. Kyte
Planter, Potato-....H. P. Baltzer
Plastic material, Handling..J. W. Buzzell et al
Plate-lifter....G. Laube
Pliers....G. L. Reichhelm
Plow....H. Tatum
Plow....N. Sanders
Plow attachment...F. G. and G. C. Malcom
Plow, Traction gang-....B. R. Hoisington
Plows, Draft attachment for....H. W. Flagg
Pocket-clasp for papers....S. Craig
Pole-base....M. H. Murray
Pole, Vehicle-....A. L. Summer

Potato masher and beater.....S. R. Albright
Power-producing machine, Weight.....
.....P. D'Agostino
Pressing-board, Steam.....R. H. Ball
Pressure device.....R. Janney
Pressure-recording gage.....A. P. Phillips
Printed publication.....H. T. Marshall
Printing and ruling machine.....W. Panter
Printing-machine.....T. R. G. Parker
Printing-machine.....R. P. Saxton
Printing-plate and producing same.....
.....G. R. Cornwall
Printing plates, Making cut..H. L. Bell, Sr.
Propeller-guard.....J. L. Hawthorne
Pulverizer.....F. D. Maltman
Pump.....J. M. Stratton
Pump, Air.....J. S. Hemenway
Pump-governor.....L. Kjerulff
Pump, Rotary.....J. R. Kinney
Pump, Well.....A. N. Blazer
Pumps, Releasing device for well.....
.....A. F. Clarke
Pumping apparatus.....C. C. Hill
Rail-chair.....S. Mogyorosi et al
Rail-joint.....J. H. Williams et al
Rail-joint clamp.....A. C. Munn
Rail-joint, One-piece.....A. L. Stanford
Rail, Switch.....J. B. Strong
Railway-rail joint.....H. Nablefeld
Railway-signal, Automatic electric.....
.....J. Friedlander et al
Railway-tie.....W. W. Hill
Railway-tie.....D. Borth, Sr.
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Rand-machine.....E. L. Pope
Range-finding sight.....S. W. Carter
Ratchet-wrench.....J. C. Heinrich et al
Razor.....T. C. Durham
Razor, Safety.....L. D. Saxton
Refractory substance.....F. Grossmann
Regenerative reversing-furnace...L. L. Knox
Rein and trace holder.....E. Weerts et al
Rein-holding attachment for vehicles.....
.....J. M. Peterman
Reins, Tension device for harness.....
.....W. E. Woods
Relay.....A. E. Stevens
Resilient wheel or tire.....R. V. Wagner
Revetment.....J. A. Norton
Rolling-mill.....L. D. Davis et al
Rotary engine.....J. M. Lively
Rotary engine.....J. R. Kinney
Rotary engine.....D. Conekin
Rotary explosion engine.....E. J. Conill
Rotary steam-engine.....W. R. Harper
Sad-iron.....J. M. Harper
Sad-iron.....C. E. Safford
Safety-elevator.....H. W. Dunlap et al
Safety-pin.....A. E. Shupe
Safety-pin.....J. Johnson
Saliva-ejector.....J. B. Jordan
Salts, Decomposing.....J. Whiting
Sander devices, Trap for.....H. Vissering
Saw attachment, Chain.....R. L. Muir
Saw-handle.....W. E. Dillard
Saw-setting machine.....B. Hadley
Sawbuck.....J. S. Kemp
Sawing machine, Stave.....J. B. Luttrell
Sawing-machines, Saw-bar for motor-driven..
.....P. R. Kramer
Scaffold.....H. O. Coffin
Screw-driver attachment.....E. J. Douglas
Seed huller, Differential-speed-roller cotton-..
.....T. McDonald
Seesaw.....J. D. and O. H. Miller
Separating mechanism.....J. Loufek
Separator.....J. K. White
Sewing-machine shuttle.....H. A. Bates
Shade and curtain bracket support and shade-guide, Combined.....E. Hoxworth
Shade attachment.....H. D'Olier, Jr.
Shaft and the like coupling.....C. Cottin
Shaft-brace.....A. R. Friedmann
Shaft, Cannon-pinion.....W. B. Mehl
Shaft-hanger.....H. E. Norbom
Shears, Tension device for.....G. M. Crider
Sheet-metal-bending machine...G. C. Frazier
Sheet-metal-corrugating machine.....
.....W. H. Cooley
Shelf-support.....J. Knape
Shelving.....C. E. Gerberich
Shock-absorber.....F. W. Merritt
Shoe cleaning and polishing device..J. Elmer
Shoe cushion and ventilator, Arch-support..
.....P. Hammer
Shoe-protector.....M. Rasmussen
Shoe-rands, Manufacturing.....W. L. French
Show-case.....C. H. Soucek et al
Sifter, Enameling-powder.....W. Lindsay
Signaling device.....H. Macdonald
Signaling system, Resonant cab.....
.....H. D. Patterson
Silencer.....J. M. Miller
Silhouettegraph.....B. H. Coffey
Silver from fixing solutions, Apparatus for separation of.....C. W. Judd
Skirt-marker.....A. Donnelly
Skirt-marker.....C. S. McMartin
Skylight.....J. N. Grenier
Sleigh, Bob.....C. Hojohn
Sleigh-runner.....J. Melby
Slicing material in plug form, Apparatus for..
.....A. W. Farrington
Smoke-house.....A. Sievers
Soaps containing fuller's earth, Preparing, scouring, and other household..N. Sulzberger
Sodium carbonate, Making.....W. Hasenbach
Solder to cans, Apparatus for applying.....
.....W. F. Hebrank
Sound-box.....E. C. Smith
Spark-arrester, Locomotive..T. H. Densmore
Speculum.....W. Meyer
Speed-indicator.....F. Spalding
Speed-regulator.....G. C. Davison
Spike-puller.....W. L. Varner
Spinning-machine thread-guide support.....
.....W. Forget
Sponge-cloth wringer.....A. Levin
Sprinkling apparatus.....N. Bacigalupi
Stackers, Brake mechanism for hay-.....
.....O. P. Vroom
Stalk-cutter.....W. W. Davis et al
Stamp, Time-.....C. C. Sibley
Staple.....J. N. Hahn
Starch, Manufacture of modified..W. Thomson
Steam-generator.....J. M. Lively
Steam-joint, Rotary.....J. Nuttall
Steel castings, Heat-treating...W. G. Kranz
Steel, Producing alloyed.....F. L. Antisell
Stereotype-plate-casting apparatus....W. Scott
Stock-line recorder.....J. E. Johnson, Jr.
Stoker, Mechanical.....C. W. Willey
Stokers, Actuating mechanism for automatic..
.....J. R. Fortune et al
Stokers, Gate for mechanical..W. M. Duncan
Stove, Gas heating.....A. C. Mott
Stoves, Cloth-rack for.....M. Krystowiak
Street-indicating device.....G. H. Doyle
String or cord fastener.....C. W. Hamilton
Stropping-machine.....E. B. Gibford
Structural metal shape.....P. Stragiotti
Stuffing-box and clamp, Combination.....
.....A. F. Clarke
Surgeon's and physician's case.....
.....M. P. Hermann et al
Surgical chair.....I. Eaton
Suspension-clamp.....A. O. Austin
Switch-rod.....R. E. Einstein
Syringe.....J. W. Wainwright
Talking-machine.....C. Vogt
Talking-machine sound-box.....E. R. Johnson
Tank-heater.....H. Scott et al
Tap-screw for plugging leaks...E. A. Gehrke
Tape for tennis-courts and the like..R. Moore
Target.....J. J. Metzger
Telegraph-arm.....M. Lachman
Telephone-support, Adjustable..R. Krum et al
Telephone system.....S. H. Couch
Telephonic apparatus.....P. M. Oliver
Telephony.....R. C. M. Hastings et al
Temperature-regulator motor....C. E. Jewell
Threshing-machine beater.....F. Eves
Threshing machine, Flax-.....J. D. Jefferson
Ticket, Railway.....T. C. Davidson
Tile-making machine.....W. J. McCracken
Tiller, Soil.....W. L. Brown
Time-alarm.....J. W. Haywood
Time-switch, Automatic.....P. J. Stuparich
Toaster, Electric.....L. F. Parkhurst
Toaster, Electric.....J. I. Ayer
Tobacco, &c., Machine for treating..W. Miller
Tobacco-pipe.....W. E. Elam
Tobacco-pipe.....J. Madrow
Toilet articles for personal wear, Making....
.....J. Wilcox
Tool, Combination.....P. F. Pilliner
Tool, Combination.....W. Ducharme
Tool-head clamp.....E. J. Mayer
Tool-holder.....E. Rawson
Top.....S. Gropper
Toy, Flying.....W. W. Katterjohn
Tramway-switch.....D. D. Samaia
Trap-door for sidewalks.....W. H. Jones
Trolley.....E. N. Hescock
Trolley-retrieving device.....G. W. Snow
Trousers.....F. H. Sprague
Truck, Car.....B. Magor
Tube-bender.....G. F. Andres
Tube holder, Collapsible.....C. P. Clarke
Tubes, Key for rolling up collapsible.....
.....F. Kinsey
Tunnel-segment.....F. F. Vandevort
Turbine.....E. E. Hauer
Turbine.....H. F. Weinland
Turbine.....T. S. Kemble
Turbine governing mechanism, Elastic-fluid-..
.....J. G. Callan
Turbine governing mechanism, Elastic-fluid-..
.....R. H. Rice
Turbines, Nozzle for elastic-fluid..G. E. Stevens
Turning poles, Grappling implement for.....
.....J. C. Shelton et al
Twine-carrier.....C. M. Bartlett
Twine-making machine, Grass, 2 pats.....
.....E. W. Goodrick
Type-writing machine, 2 pats..J. C. McLaughlin
Upper-hanger.....D. T. French
Valve.....P. A. Gstalder
Valve.....G. B. Moore
Valve, Balanced.....C. A. Turner
Valve-controlling mechanism..P. L. Wormeley
Valve-controlling mechanism.....J. M. Roe
Valve, Dispensing and measuring.....
.....F. A. Osincup
Valve for steam-heating systems..O. C. Hatch
Valve for water-backs, Thermostatic.....
.....J. Harrington
Valve-gear.....H. O. Lawrence
Valve mechanism for discharging air and water of condensation from steam-heating systems, 2 pats.....B. E. Van Auken
Valve, Self-seating and self-closing..S. G. Neal
Valve-setting mechanism for locomotives.....
.....J. L. Randolph
Valve, Vacuum-radiator.....A. S. Light
Vault or sepulcher.....D. Renshaw
Vehicle-brake.....S. F. Boyce
Vehicle-wheel.....L. Bloch
Vehicle-wheel.....A. H. Towle
Vehicles, Road-indicator for.....F. Feilhuber
Vending-machine.....A. B. Jones
Vending machine, Bottle-...J. H. Mathewson
Ventilating system.....A. S. Johnson
Ventilator.....R. M. Hill
Vise, Bench.....J. E. Priest
Wagon-box.....O. O. Newberry
Wagon-rack.....C. Linguist
Wagons, Dog for log.....H. Golden
Washer.....W. E. Coffin
Washing-machine.....T. T. Burgess
Washing-machine.....J. H. Bullock
Washstand-support.....A. V. Conradt
Watch-movement click.....W. H. Ebelhare
Watches, Crown for winding-stems of.....
.....H. Axtell
Water, Automatic supply and heating.....
.....R. C. Sayer
Water electrolytically, Purifying.....
.....H. B. Hartman
Water-heater.....A. F. Millan
Water-heater.....O. A. Marquardt
Water-purifying apparatus, Control valve mechanism for electrolytic...H. B. Hartman
Water-purifying apparatus, Electrolytic.....
.....H. B. Hartman
Water, Removing iron and organic germs from.....
.....R. Gans
Water-wheel, Current.....L. Lemert
Weaving fabrics.....J. C. Brooks
Wedge-cutting machine.....H. Lechtenberg
Weevil destroyer, Boll-...R. P. Johnson et al
Weighing-machine.....G. H. Denison
Well-screen.....H. M. Dahl
Wells, Bailer for oil and like.....L. C. Sands
Wheel.....I. H. Lau
Wheel attachment, Vehicle.....G. E. Kimmel
Wheel-brake.....W. A. Paris
Whip-holder.....M. G. Brown
Whip-lock.....E. Goff
Wick, Lamp.....G. A. Horn
Winding and like machine, Yarn or thread..
.....J. Higginson, Jr., et al
Window.....M. Lande
Window and window-frame..R. W. E. Buttlar
Window-cleaning device.....W. E. Allen
Window-grating.....J. D. Hughes et al
Window-seat.....G. Hinman
Wire-netting and field-fencing, Machine for making.....J. A. Holmquist
Wire-stretcher.....E. Godwin
Wire-stretcher.....E. B. Zimmerman
Wireless controlling device....C. L. Coleman
Wreck-preventer.....E. B. Poole
Wrench.....Z. M. Paul
Wrench.....G. Johnson
Yarns and fabrics by the special utilization of washed flax-waste, Manufacturing.....
.....E. Korselt et al

DESIGNS.

Badge or similar article.....A. J. Moss
Curtain-pole.....M. R. Ward
Emblem.....J. H. O'Neil
Furniture-brace.....A. Wanner, Jr.
Hand-bag.....I. J. Levy
Harness-spreader.....C. H. Anderson
Label-blank.....W. C. Henderson
Musical-instrument body, Stringed-..A. Shutt
Tire, Automobile.....I. B. Kempshall
Vase.....H. M. Dawley
Whisk-broom and brush holder.C. O. Seaman

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Acetylene-separator.....C. C. Wakefield
Acid, Obtaining acidylic derivatives of esters or dimethylamino-dimethyloxyacetic.....
.....E. Fourneau
Acids, Preparation of esters of oxyamino....
.....E. Fourneau
Adding-machine.....E. M. Plummer
Advertising closet-seat cover.....L. D. Castle
Air-brake.....W. S. Bilbrey
Air-brake system, Direct.....A. Doan
Air-brake systems, Cock-controlling device for.....V. J. Koehler
Alloy, High-resistance iron...W. R. Whitney
Alloy, Steel, 2 pats.....S. S. Wales
Anchor for air-ships and the like, Safety-....
.....F. von Ehrenberg
Angle-pieces for use in structural frames, metallic standards, &c., Rigid metal.....
.....P. Phipps
Apron, Blacksmith's.....E. C. Beckmann
Automobile-controlling means....H. E. Coffin
Axles, Driving mechanism for divided, 2 pats
.....C. H. Johnson
Bag-fastener.....J. S. Isidor
Baling press, Cotton-.....E. A. Withers
Barge, Coal-loading.....W. Yoha et al
Barrel-hoop.....C. Hoff
Basket-making machine.....W. F. Barnes
Bath-tub trap, waste and overflow pipe attachment.....D. J. McIntyre
Battery holder, Electric.....C. T. Mason
Bearing, Antifriction.....L. H. Seubert
Bearing, Roller.....J. Ramslie
Bell, Door.....W. R. Moore
Bicycle brake-controlling device..B. Péducasse
Billiard-cue.....J. Baeumle
Blind-operating device.....J. Bolewicz
Blind-slat-operating device.....J. Bolewicz
Board.....J. T. Ferres
Boats, Safety device for submarine.....
.....W. A. Stevenson
Boiler.....J. G. Hayden
Boiler-setting.....E. H. Cheney
Book-holder.....S. G. Eghian
Book-marker.....T. A. Chelson et al
Bookbinding.....M. C. Neuner
Boot.....E. Daniel
Bottle and stopper.....A. T. Wannenwetsch
Bottle holder, Milk.....F. M. Furber
Bottle, Non-refillable.....H. S. Cronk
Bottle, Non-refillable.....S. O. Martin
Bottle, Non-refillable.....F. Adams
Box-opener.....J. Tremblay
Box or receptacle.....W. Kreuzkamp et al
Brake-beam.....C. H. Williams, Jr.
Brake-head for solid beams, Reinforced.....
.....C. H. Williams, Jr.
Bread, Peppermint-.....M. A. Heinzer
Brick-drying shed.....E. H. Callaway
Brick, tile, or other articles, Apparatus for baking glazing, or enameling.....L. Houze
Bridge, Suspension-.....W. A. Wood
Brush-cutter.....W. Gilbert
Building-block.....D. McIntyre
Buoy, Reel life-.....A. Rust
Cabinet.....W. M. Shields
Cable-reel.....G. E. Lynch
Calculating-machine.....A. Burkhardt
Calculating-machine.....E. Jahnz
Can-cover holder.....H. M. F. Leighty
Can-filling mechanism.....R. Schilling
Can opening and closing implement.....
.....A. E. Zesse
Cane and camp-stool, Combined...M. Killian
Car-brake.....J. W. Lamoreaux
Car-coupling.....S. Winter
Car door, rain-.....J. E. Faucett
Car-door hanger.....W. R. Kilner
Car-door lock.....J. F. Billy
Car, Dumping.....A. Becker
Car fender, Motor.....R. Forward
Car, Gondola.....A. Becker
Car grain-door.....C. O. French
Car-stake socket..C. T. and W. H. Eaid et al
Car-underframe, 3 pats.....A. Becker
Car underframe, Railway-.....J. G. Brower
Carburetor.....T. H. Van Buren
Carbureter.....F. W. Hagar
Carpet fastener, Stair.....H. C. Adams
Case-filler.....S. M. Heulings
Casing, Puncture-proof..W. M. English et al
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Chair-cane.....F. Tum
Chair fan attachment, Rocking-.A. A. Brodeu
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.....A. L. Undeland (Reissue)
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Churn.....C. Arsti[illegible]
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Clamp.....N. Bar[illegible]
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.....S. W. Bram[illegible]
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Engines, Operating oil-.....E. Higgins
Engines, Throttle-operating mechanism for explosive.....A. Winton et al
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Feeding device, Automatic proportional.....
.....E. I. Noxon
Felly-finishing machine.....C. W. Borg
Fence-post.....D. H. Miller
Fence-stretcher.....M. Wilson
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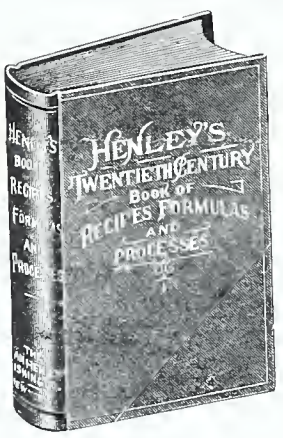

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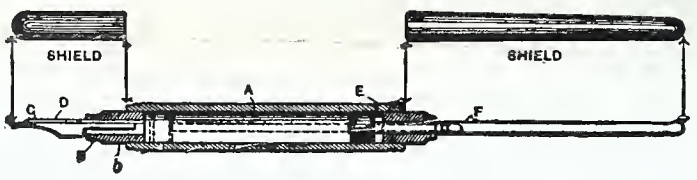

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A PERPETUAL MOTION ADVERTISING NOVELTY.

By CHARLES ALMA BYERS.

THE accompanying photograph illustrates an advertising novelty operated entirely by perpetual motion. It consists of a wheel about twenty-one feet in diameter, supported by a steel frame which spans a narrow street a block in length in Los Angeles, California. The wheel is perpetually rotated by the ever-changing positions of the nine brass balls, nearly one foot in diameter, the weight of the balls being constantly shifted to such positions as to act as gravity-leverage. The positions of the balls are regulated by nine spoke-like "runs," straight on one side and curved on the other. The straight side of the "runs" causes the balls to seek the farthest point from the center of the wheel or hub, while the curved side tends to roll the balls toward the center. It is in this way that the leverage is constantly maintained, and hence the wheel is kept slowly rotating.

The novelty was invented by a resident of Los Angeles, California. The street in which it is located, as well as the business houses bordering thereon, is the property of the public schools of that city. As an advertising novelty it is very much of a curiosity, but the power developed is not sufficient to be useful for other purposes.

The device is ingenious, and will doubtless be an attractive form of advertising. It should be noted, however, that more time and effort have been spent on the search for perpetual motion machines than have been devoted to any other of the problems that have occupied the attention of the human mind since the dawn of civilization, and the attempts to solve it would seem to have been thoroughly paradoxical. There has been a wide spread impression that a reward had been offered by the government for such a device, as a means for finding longitude, and the hope of attaining this reward has spurred many of those who have devoted their time and substance to this subject. Of course no such reward has ever been offered, as the principle is considered a scientific impossibility.

By perpetual motion is meant a machine which, without assistance from any external source except gravity, shall continue to go on moving until the parts of which it is made are worn out. Some insist that in order to be properly entitled to the name of a perpetual motion machine, it must evolve more power than that which is required merely to run it. It is true that almost all those who have attempted to solve this problem have avowed this to be their object.

There are several legitimate and successful methods of obtaining practically perpetual motion, provided we are allowed to call to our aid some one of the various natural sources of power. There are many mountain streams, for instance, which have never been known to fail, and which by means of the simplest kind of water wheel would give constant motion to any light machinery. The wind may be harnessed so that it will furnish power, and it does not require much mechanical ingenuity to provide means whereby the surplus power of a strong gale may be stored up and kept in reserve for a time of calm. This has frequently been done by the raising of weights, the winding up of springs, the pumping of water into storage reservoirs and other simple contrivances.

The power of the tides could also be utilized to effect what would be practically perpetual motion, as well as the variations occuring in the temperature and the pressure of atmosphere. A clock was exhibited in London some years ago whose working power was derived from variations in the quantity, and consequently in the weight of the mercury, which was forced up into a glass tube closed at the upper end and having the lower end immersed in a cistern of mercury after the manner of a barometer. It ran for several years, and kept good time. Another clock had a silver rod for a pendulum, and this expanded in the daily rise of temperature, and wound up the clock by means of a train of levers. There was a disconnecting apparatus so that the contraction due to a fall in temperature had no effect, and a similar

arrangement prevented overwinding. A rise of eight or nine degrees F., was sufficient to wind up the clock for twenty-four hours.

Inventions of this kind might be multiplied indefinitely, but none can be called perpetual motion, because they all depend for their action upon energy derived from external sources other than gravity. The real perpetual motion devices embody fallacies, or inventions made by honest but ignorant persons in direct violation of the fundamental principles of mechanics and physics. This class covers a large variety of devices, such as weight balances, ball carrying belts, hydrostatic wheels, tilting trays or disks and balls, etc. Eccentric weights are perhaps most attractive to the minds of inventors, and the attempt to compel a water wheel to raise the water which drives it in one form or another is always recurring. When such devices are presented to the Patent Office—as happens almost daily—the applicant is requested to furnish a working model of his invention, and that usually ends the matter.

A Radium Clock.

A marvel among timepieces is the radium clock, invented by an Englishman, who claims that if it is not touched, his ingenious apparatus will run for thousands of years. On a quartz rod in an exhausted glass vessel is supported a tube containing a small quantity of radium. An electroscope consisting of two long strips of silver is attached to the lower end of this tube. The natural action of the radium sends an electric charge into the strips and causes them to separate until they touch the sides of the vessel, where they are instantly discharged and fall together again. Every two minutes this operation is repeated automatically, so that each beat of this wonderful time keeper is in reality two minutes long.

The most trustworthy clock in the world is said to be that in the basement of the observatory at Berlin, installed in 1865. It is enclosed in an air tight glass, and has frequently run for two or three months with an average daily deviation of only fifteen one-thousandths of a second. Yet astronomers are not satisfied even with this remarkable accuracy and their efforts are constantly in the direction of more ideal conditions for a clock, by keeping it not only in an air tight case, but also in an underground vault where neither change of temperature nor of barometric pressure can ever effect it.

How to Get Copies of Patents.

THE INVENTIVE AGE prints each month a list of the patents granted by the Patent Office. This list includes the name of the inventor, the title of the invention and the date of the patent. Anyone can procure through THE INVENTIVE AGE a copy of any patent included in the list, by giving the data and enclosing ten cents in stamps for each copy. There is no better way of keeping yourself informed about the progress of the arts, than by scanning the list each month and ordering copies of patents.

THE GERMAN COMET SEEKER.

A unique form of telescope has recently been designed and constructed at Jena, Germany, called the "Comet Seeker." The accompanying illustration shows the device and the method of controlling the position of the observer in relation to the telescope, by means of a sort of a bicycle wheel attachment. This is located at the side of the seat and is operated with one hand, while the movable sector near the eye piece of the instrument is controlled with the other hand, as appears from the illustration.

It may be stated that the comet seeker has a focal length of 1¼ yards, and a free opening of 4 inches. The instrument has great light gathering power, and was designed for the special service indicated. It is mounted on a brick and concrete foundation for test, and is so delicately poised and balanced as to be capable of movement in any direction desired by the observer, without the slightest difficulty.

This device may find application in studying the celestial visitants with which we are being favored. All America has been interested in the famous Halley comet, and astronomers have recently observed others. A huge comet came suddenly into the sky a couple of months ago, and was subjected to study in Southern Europe and Africa, where alone it was visible. Minute observations were made, and from these, and from the data accumulated with reference to the Halley traveller, we may hope that we are now on the verge of some great generalization, which, to quote an English astronomer, may explain "the very nature of gravitation, if not of those mighty energies which, by the aid of the most minute conceivable entities, are now found to bridge over the vastest of distances." It is because we find in these strange bodies indications of the joint action of light pressure, electricity and radiations of every kind, that they afford to the physicist one of the most encouraging fields in which to test the newest theories.

Thanks to the spectroscope, that instrument which enables a chemist to identify any element by its light when heated to incandescence, comets have been, so to speak, magically transported to our laboratories and analyzed with nearly as much accuracy as if they were stones picked up on the road. The composition of the comet, it has thus been found, is not unlike that of the blue flame in our gas stoves. It consists chiefly of hydrogen and carbon combined. As the comet approaches the sun and its temperature rises, the spectroscope reveals the presence of iron, magnesium and other metals in the nucleus. The temperature is then raised to a heat in which the most infusorible substances of earth would be vaporized.

While a comet's motion may be seriously affected by planetary attraction, the planets themselves are not injured by comets. They do not affect the stability of the solar system, but they may cause meteorological disturbances. Their tails measure sometimes 100,000.000 miles in length, and when these come in contact with our atmosphere, they may disturb it. The tail of the comet is illuminated only by the cathodic rays emanating from the sun. These act upon the minute phosphorescent particles and are transformed into Roentgen rays. The tail is therefore a tremendous source of these X rays, whose wonderful power of penetration is well known. They have also the property of causing the condensation of vapors, so that rains of great duration, and consequently inundations, may be the result. The ancient superstition that comets are manifestations of the wrath of the celestial powers, and are dangerous to the earth, may thus have some scientific foundation.

Braking the Rails.

An electro-magnetic brake, adapted particularly for mountain railroads, and operating on the rails rather than on the car wheels, has been tried in Germany. It comprises a pair of pole shoes, parallel to the rails and close to them. The weight of the brake is but three per cent of the pressure it exerts, and the braking effect may be increased by lengthening the shoes. A similar idea was tried in this country a few years ago, but the electricity was applied directly through the wheels to the track instead of through pole shoes.

Better Air.

Everybody knows the value of oxygen, and that it can be changed into ozone—the great weapon against germs and other foes of the human race. Sunlight itself is constantly producing it in diluted form, disinfecting daily the air we breathe. The disinfecting properties of ozone have recently been applied to the purifying of drinking water, and this seems to have suggested the idea of producing the agent artificially for the purpose of purifying the atmosphere. A German scientist is trying to run air through a machine and make it better stuff to breathe. He has devised an ozone ventilator, which produces the active gas by means of the employment of high temperature. It has been found that certain chemical reactions take place in air under tremendous heat, and that ozone is one of the products. The ventilator draws the air current over the flame of a Nernst lamp, raising it to a very high degree of heat. Immediately thereafter, the current is plunged directly into cold air again, and the sudden drop in temperature makes the ozone available. A fan designed to exert suction is placed just inside the funnel, which is provided with a filament. The filament is an electric conductor which passes the current only after being raised to a certain degree by means of a heating coil. When the ventilator is started, therefore, the heating coil receives the first current. At the moment the filament becomes conductive and therefore ready for business, an electro-magnet inserts the fan motor and disconnects the heating outfit. A lamp, arranged in series, serves as additional resistance.

Although ozone is most valuable in destroying impurities in the air, it also has in a concentrated form a damaging effect upon the mucous membrane and is injurious to the human body. One-tenth of one per cent is all of the oxygen of a room which it is considered safe to turn into ozone. The new apparatus converts just that much of the oxygen into the effective gas. When the air is brought to the condition where it contains the proper percentage, the machine destroys an amount equivalent to the amount produced, so that the average is kept constant. No harmful effect can follow, and as the ozone is used up by the lungs and fulfills its task of microbe killing, it is constantly replaced by the machine. The result is an ideal ventilator.

In buildings for public use, schools, churches, theaters, etc., which are notoriously difficult to ventilate, the new apparatus has an important work to do. In many workshops, too, it will be found useful. On shipboard, passengers from cabin to steerage will benefit by it, and it may even be applied to the support of livable conditions in submarines, to supplement apparatus now in use.

HYGIENIC ICE GOBLETS.

THE ice goblet was described in a recent issue of the INVENTIVE AGE, but the novelty of the device justifies further notice, and the illustrations herewith give a better idea of its nature. Special refrigerating equipments have been installed in European cities, which produce the goblets at extremely low cost.

The ice goblet is a conical drinking vessel in the shape of a tumbler made entirely of ice and placed in a paper shell, the latter serving as a protection against surrounding heat and direct contact with the hand.

It is stated that the ice tumbler melts very slowly in this paper receptacle, holding the beverage fully half an hour in summer. It weighs less than four ounces, and has walls one-eighth of an inch thick, slightly increasing toward the bottom. It measures five inches high and holds about nine fluid ounces, and is made either of porcelain whiteness or like clear glass as desired, vegetable matter being utilized in the water if preferred to make its appearance more attractive.

FIG. 1.—MOLD AND GOBLET.

The hygienic properties of the ice goblet will be at once recognized, as it is thrown away after use. Pure distilled water is utilized in the manufacture, and it is not touched by the hand, so that the sanitary conditions are perfect.

For advertising purposes, the paper shell is unique, and the cost of producing the latter with the ice goblet complete being only a fraction of a cent, its use for the sale of all refreshing beverages will become general at an early date.

A small refrigerating machine is necessary in the manufacture of the ice tumbler, and it may be operated by electric power or otherwise, as indicated in the accompanying illustration. The apparatus consists of a mold into which a measured quantity of water is poured and then a core inserted, leaving a space into which the water is pressed. In the wet method of refrigeration the mold is placed in brine which is maintained at a temperature of 14 degrees F. The ice goblet is ready in about 15 minutes, though at a lower temperature it may be produced in six minutes.

When once frozen the tumbler is not removed in the ordinary way, by thawing it out, as this would obviously be its ruin; but by using a new principle—release by successive expansions. The mold is, therefore, made of metal expanding more rapidly than ice, and the core is made of porcelain expanding more slowly than ice—a special porcelain.

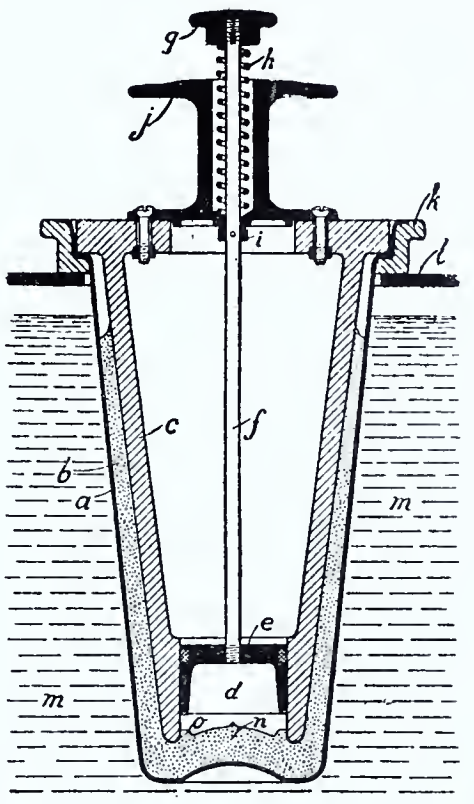


FIG. 2.—MAKING THE GOBLET.

The apparatus is placed for a while in a special heater, which causes the mold to expand, without transmitting any perceptible heat to the goblet, and the latter is then drawn out. It will be seen in the illustration (Fig. 2) that there is a bell-shaped piston, *d*, carried by a rod *f* ending in a handle *g* outside the core. On pressing the handle downwards, the piston expels the ice goblet, which is then caught in a paper shell. The whole operation can be performed in a few seconds, and this enables the goblet to be produced perfectly dry, without loss. The core is also still very cold, and the only part of the apparatus which perceptibly rises in temperature is the mold. The latter is refilled, and the

FIG. 3.—VERTICAL SECTION.

core is inserted for freezing the next tumbler; and it is held that this process of manufacture is economical, rapid and simple, so that three and a half ounces of water are transformed into ice without appreciable loss in refrigeration. As about one hundred goblets per hour can be made with one horsepower, considerable numbers can be produced with very small refrigerating machines.

In the "dry method," the mold is surrounded by a casing closed by the cover in which the mold is fixed. Through an inlet a liquefied gas is admitted to the space in the mold. Freezing then commences, the gas evaporating and passing through holes at the upper part and returning to the refrigerating machine, where it is liquefied and recommences the same cycle.

When the ice goblet is frozen, the inlet is closed and the mold is heated electrically by passing a current through a resistance wire wound between two insulating rings so as to form a cage around the mold, without touching it, and ending at terminals passing through the cover. The electrical heating can be applied in various ways, and it has the advantage of being easily regulated. It is obvious that this method of refrigerating is economical and rapid.

At the ice goblet plant at Scheveningen, Holland, only a young man and a girl are necessary as attendants. An electric motor drives an overhead

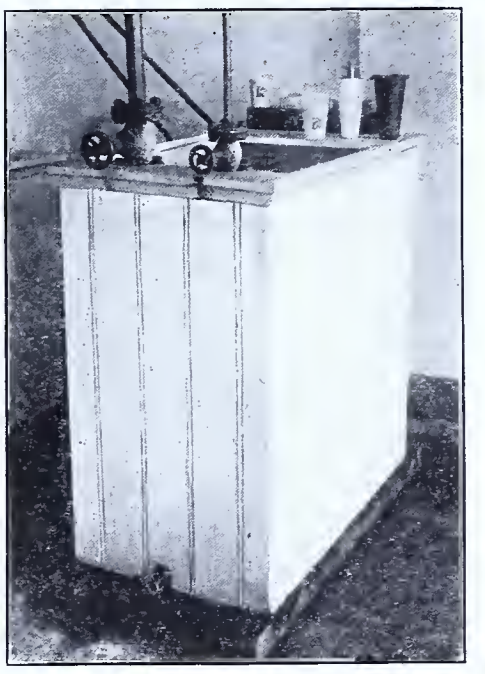


FIG. 4.—REFRIGERATOR.

shaft, and operates a refrigerating machine, two refrigerators for freezing the ice goblets, and a cooling chest for storing two hundred ready-made tumblers. The latter as made are put in the chest, which consists of separated compartments, each provided with a close fitting door. The attendant has nothing to do but to fill them, there being no washing or cleaning, as with glasses. By using this refrigerator to store the goblets, the process of manufacture goes on regularly. With this plant, over three hundred ice goblets can be produced per hour.

It is of interest to note that a small compact machine has been designed for fifty ice goblets per hour, including machines, refrigerating motor and cooling room, which does not occupy more than three by seven feet and weighs half a ton. When the machine is stopped, the ice goblets left overnight in the refrigerator are still in good condition next morning, and perfectly saleable. The goblets can also be transported in refrigerated or insulated cases and remain good for many hours.

Basket Making.

Except among the aborigines, the making of willow baskets is not an industry of any importance in this country. Americans as a rule care little for the home occupations that are of such value to the peasantry of Europe. The cultivation of willows for baskets is one of the many things that have been neglected in this country. Willow is the best material for baskets, but the cheap splint and veneer articles that are turned out in factories at a minimum cost have displaced it in popular favor. With the growing congestion of population, however, the need of new methods of making a living has become apparent, and the Agricultural Department is making an effort to introduce willow craft on this side of the water. The Department has a large experiment farm on the Potomac flats near Washington, and willow cuttings are sent out to those who would like to undertake the work.

There are more than 150 species of willow, and they grow all over the world, from the equator to the artic. It is a mistake to think that they require a damp situation; willow is not sensitive to moisture like most other trees, but as it will not thrive in the shade, it is forced to occupy low and open places. Ground that is merely wet is not suited for cultivating willow. The soil is prepared as for grain, and the cuttings are placed in rows three feet apart and a foot apart in the row. They are simply stuck in the ground, and they take root very readily. The first year the stand is cultivated carefully, so as to prevent its being choked by weeds. The shoots for the first season are two small to be sold, but in the second year a good sized crop can be cut, and a full crop can be had thereafter for a dozen years.

After the shoots are cut, they are sorted into four sizes, according to length, and tied into bundles of 40 pounds. These are stood in shallow water for several weeks until they begin to sprout, when they are ready for peeling. This is a most important operation. Many American growers, who are impatient with hand work, steam the shoots to make them peel easily, but this makes them dark in color, and sap peeled willow is worth four times as much as steam peeled. The work is done by drawing the shoots through a springy forked utensil, shaped something like a clothes pin.

Good willow stock brings 6 or 7 cents a pound, and the Agricultural Department estimates that a profit of as high as $80 an acre can be made from a properly managed crop. At present, American willow is having trouble in competing with the cheap foreign product, but it is believed that by improved methods our planters can drive the latter out of the market. The making of willow ware is an ideal home industry. It is a clean, light occupation, which can be taken up at odd hours during the winter or rainy days, and one in which the whole family can join, thus turning to profit time which would have no commercial value. The forestry bureau will furnish the names of manufacturers who buy willow stock.

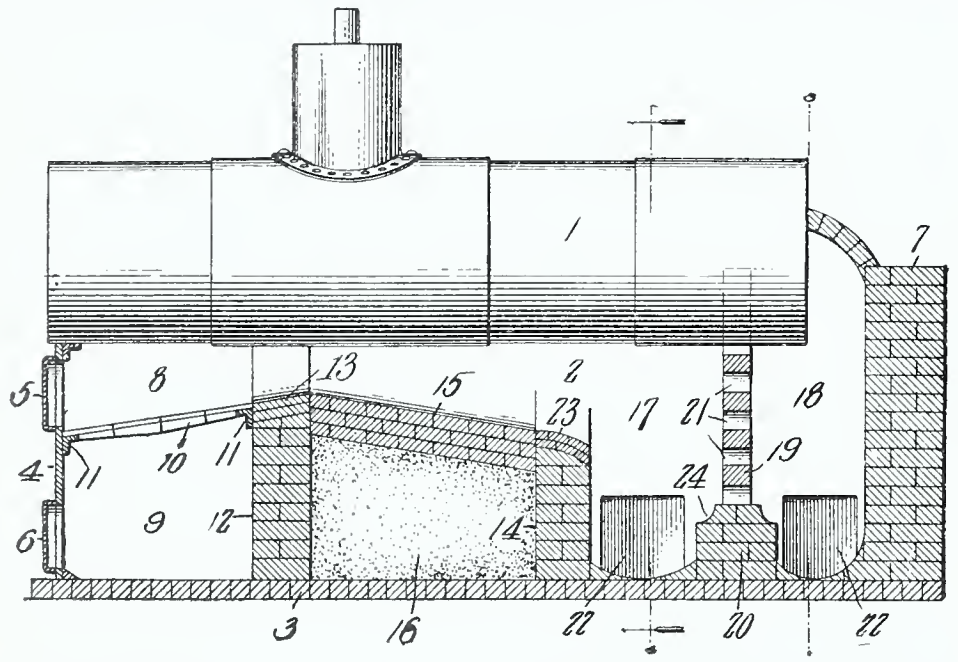
Rattan, or cane, is also a competitor of willow for many purposes, but the latter has uses for which it is superior to anything else. Willow furniture as gained quite a vogue of late, and light and strong trunks can be made of this material. There are many ways in which it can be utilized to good advantage.

CLEVER NEW PATENTS.

BOILER FURNACE.—KNOCKDOWN RECEPTACLE.

Boiler Furnace.

One of the material drawbacks to the furnace commonly in use is the loss of a large proportion of the products of combustion. Most of the heat goes up the chimney, which involves wasteful consumption of fuel. An apparatus which is so arranged as to effect a balanced draft between the fire box and boiler furnace, and to permit the smoke and gases to be thoroughly consumed before passing into the boiler tubes, so as to better heat the boiler, has been patented by Charles Henry Wilson, of Paducah, Kentucky. The construction may be understood from the accompanying drawing, which gives a longitudinal section of the furnace in connection with a steam boiler. The walls, etc., are made of fire brick, and the boiler may be set on the side walls in any

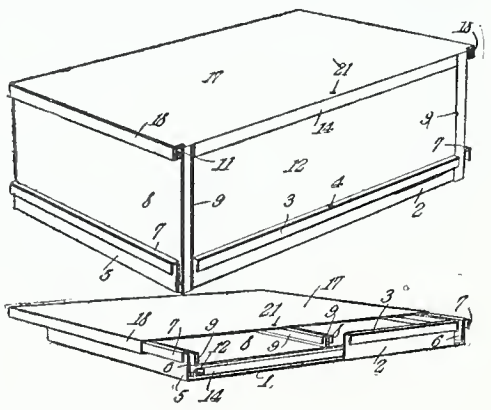


approved manner. At the front end of the boiler 1 are the fire box and ash pit, 8 and 9, the grate bars of the former being inclined downwardly toward the front to facilitate cleaning the fire. The top of the bridge wall 13 inclines upwardly from the fire box, and from the rear end of the bridge the fire bed 15 inclines downwardly to the top of the wall 14. The bridge, bed and upper surface of the wall 14 are concentric with the boiler, which serves to more evenly heat the latter. The space between the walls 12 and 14 is filled with sand, which retains the heat a long time. The two combustion chambers 17 and 18 back of the wall 14 are separated by a wall, the portion 19 of which is perforated. The area of the perforations is preferably equal to the flue area of the boiler. The ash pits at the bottom of the combustion chambers are rounded so as to permit the gases, under the influence of the draft, to create a whirling action, and thereby pick up the soot and other unburned particles so that they will be consumed. The rear wall of the boiler is so spaced from the rear wall of the furnace as to provide an outlet area from the combustion chamber to the flues. The wall 19 extends around the boiler at such a distance therefrom as to provide a heating space, which in addition to the perforations, permits the fire gases to pass to the rear combustion chamber. This wall baffles the gases and prolongs their combustion. It will be seen that the upwardly inclined bridge deflects the gases around the whole surface of the boiler, and as they pass over the bed 15, further combustion takes place and the flames are forced to envelop the boiler, all of which increases the heat efficiency of the device.

Knockdown Receptacle.

The convenience of collapsible boxes, which can be stored or shipped in small space without danger of the parts becoming misplaced, is generally recognized. A device of this character which has several features of novelty has been invented by Otto M. Stiehl of St. Louis, Mo. It is of sheet metal, and the parts slidably engage each other so as to prevent displacement in any direction, it merely being necessary to utilize a wire to keep the box from being accidentally opened.

The panels of the box are each formed of a single sheet of metal, strong enough to resist ordinary rough usage and having marginal flanges to engage corresponding portions of adjoining panels. The cuts show the device set up for use, and collapsed, revealing part of the interior. The base panel 1 has front and rear flanges 2, and end flanges 5, the latter being folded longitudinally to constitute interior retaining leaves 6, and exterior guide devices 7. The end panels 8 have side flanges 9, folded longitudinally to form channeled engagement members which are adapted to be inserted to connect with the retaining leaves of the bottom panel. Guides 11 are also provided on the end panels. The front and rear panels are similarly constructed, the end



flanges overlapping the outer faces thereof and slidable into engagement with the guide flanges of the end panels. The top panel has downwardly and inwardly extending guides 18 and a stop flange 19 extending down from the rear edge of the panel, and having a longitudinal extension 20 engaging the retaining portion 14 of the rear panel 12. Openings are provided in the centre and the front flanges through which sealing wires may be passed to secure the parts of the box firmly together. The top panel is slidable into engagement with the guide devices of the bottom panel when the receptacle is collapsed. When it is wished to set up the box, the bottom panel is placed with its flanges 2 and 5 extending upwardly and the end panels are inserted into the space formed between the ends of said flanges. The leaves of the end panels are then inserted between the flanges 5 and the leaves 6. The front and rear panels are placed with their guides in engagement with the guides 9, and the said panels pushed downwardly to bring their lower edges between the flanges 2. This holds the bottom and wall panels rigid. To close the box, the top panel is placed with its guide member 18 in engagement with the guide 11 of the end panels. Then the top panel is shifted forward till its stop flange is brought into contact with the retaining flange 14, which registers the openings through which the sealing wire is passed.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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CUTLER v. MARYLAND HOTEL CO.

(Circuit Court E. D. Missouri, E. D. March 22, 1909. 168 F. R. p. 931.)

PATENTS—SUIT IN EQUITY FOR INFRINGEMENT—DEFENSES.

In a suit in equity for infringement of a patent for a mail chute, where the bill alleges that defendant has made or caused to be made and used a mail chute which infringes the patent, a plea denying that defendant has made or used, or is making or using, any mail chute whatsoever, and alleging that a mail chute installed in a hotel owned by it is used in the collection of mail matter, and under the statutes and regulations of the Post Office Department is the property of the United States and under the exclusive care and custody of the Post Office Department, states a defense against the right of complainant to any relief in equity, his right of action, if any, being at law for damages.

LOVELL v. SEYBOLD MACH. CO.

(Circuit Court of Appeals, Second Circuit, March 16, 1909. 169 F. R. p. 288.)

1. PATENTS — INFRINGEMENT — IDENTITY OF MACHINES.

The claims of a patent should cover only what the patentee has in fact invented, and not what he imagines he has invented; and the inventor of a practical working machine will not be held to have infringed a prior patent for an unsuccessful machine, which added nothing of substantial value to the art, merely because the language of its claims is broad enough to include the successful structure.

2. PATENTS — INFRINGEMENT — BOOK-TRIMMING MACHINES.

The Lovell and Bredenberg patent, No. 490,877, and the Lovell and Williamson patent, No. 734,907, each for a book-trimming machine, construed, and held not infringed.

HALL SIGNAL CO. et al. v. GENERAL RY. SIGNAL CO.

(Circuit Court of Appeals, Second Circuit. March 16, 1909. 169 F. R. p. 290.)

PATENTS—VALIDITY AND INVENTION—RAILWAY BLOCK SIGNALING APPARATUS.

The Wilson patent, No. 470,813, for an electric railway signal, was not anticipated and discloses invention. It covers the first successful automatic block signaling apparatus of the normal danger system, affording full protection to the train in front and rear for every inch of track, and is entitled to a construction sufficiently broad to protect the actual invention. Claim 1, as so construed, held infringed.

MALIGNANI et al. v. GERMANIA ELECTRIC LAMP CO.

Circuit Court, D. New Jersey. April 5, 1909. 169 F. R. p. 299.)

1. PATENTS—PROCESS—INFRINGEMENT.

The mere transposition of some of the steps in a patented process does not avoid infringement, where neither the principle, mode of operation, nor result is changed.

2. PATENTS — INFRINGEMENT — PROCESS OF EVACUATING INCANDESCENT LAMPS.

The Malignani patent, No. 537,693, for a process of evacuating incandescent lamps, held infringed.

BANKS LAW PUB. CO. v. LAWYERS' CO-OPERATIVE PUB. CO.

(Circuit Court of Appeals, Second Circuit. March 16, 1909. 169 F. R. p. 386.)

COPYRIGHTS—EXTENT OF RIGHTS ACQUIRED—OFFICIAL REPORTS OF SUPREME COURT.

Conceding the right of the official reporter of the Supreme Court of the United States to secure a copyright on his work in the volumes of published Reports, the mere arrangement of reported cases in sequence, and their paging and distribution into volumes, are not features of such importance as to entitle him to copyright protection of such details.

AMERICAN STEEL & WIRE CO. v. DENNING WIRE & FENCE CO.

(Circuit Court of Appeals, Eighth Circuit. April 10, 1909. 169 F. R. p. 413.)

1. PATENTS—NOVELTY—USE OF NEW MEANS OF CONSTRUCTION.

The validity of a patent for a product or structure is not affected by the process or means by which it is made or whether it is made by hand or by machinery.

2. PATENTS — INVENTION — WOVEN WIRE FENCE.

The Bates patent, No. 561,193, for woven wire fencing having parallel strand wires and a series of single plain stay wires connecting the strand wires together by being coiled at their end portions around the strand wires and intercoiled at their meeting ends, and in one form having the spaces between both the strand wires and stay wires graduated so as to form graduated meshes, in view of the prior art, is void for lack of invention.

JORDAN AUTOMATIC SIGNAL CO. v. BROOKLYN HEIGHTS R. CO. et al.

(Circuit Court, E. D. New York. March 25, 1909. 169 F. R. p. 413.)

PATENTS—VALIDITY AND INFRINGEMENT—ELECTRIC RAILWAY SIGNAL SYSTEM.

The Jordan patent No. 497,408, for an electrical signaling system for railways, has for its special object the setting of a light or other signal at electric street railroad crossings to give notice of the proximity of a car. It covers a combination of devices by which an auxiliary wire extending a distance either way from a crossing is placed parallel with, and near to, the trolley wire and main circuit, but normally insulated therefrom. The trolley wheel or other contact device on the car, however, connects the two wires and keeps them in connection until it passes beyond the auxiliary wire, and a current is sent through the same to and through a signal circuit, where it lights a lamp and sets some other danger signal and passes to the earth or other return circuit. Held, that such patent was not anticipated, and discloses invention if limited so as to include as an element the signal circuit; but as so construed it is not infringed by a train-signaling device by which a signal is normally held at safety by a current through an auxiliary wire which is shunted by an approaching train.

1900 WASHER CO. et al. v. CRAMER et al.

(Circuit Court of Appeals, Third Circuit, April 12, 1909. 169 F. R. p. 629.)

1. PATENTS — CONSTRUCTION — READING CLAIMS AND SPECIFICATION TOGETHER.

No patented invention can be practically or fairly understood or explained if the language of the claims is entirely dissociated from the specification, and the claims and specification should be read together.

2. PATENTS — VALIDITY AND INFRINGEMENT — WASHING MACHINES.

The Cramer & Haak patent, No. 829,631, for an improvement in washing machines consisting of means for applying mechanical power to actuate an oscillating tub, was not anticipated and discloses patentable invention. Also, held infringed.

WESTINGHOUSE ELECTRIC & MFG. CO. v. CUTTER ELECTRIC & MFG. CO.

(Circuit Court of Appeals, Third Circuit, April 12, 1909. 169 F. R. p. 634.)

1. PATENTS—VALIDITY AND INFRINGEMENT—AUTOMATIC CIRCUIT BREAKER.

The Wright and Aalborg patent No. 633,772, for an automatic circuit breaker, claims 2 and 5, were not anticipated and disclose patentable invention, the device being a distinct advance on the prior art. Also held infringed by devices operating on the same principle and different only in the substitution of equivalent parts.

2. PATENTS—INFRINGEMENT—SUBSTITUTION OF EQUIVALENT PARTS.

The substitution of a cam for a toggle joint in a patented mechanical combination does not avoid infringement, where the two have the same purpose in the combination and effect it in substantially the same manner.

CRITCHER v. LINKER.

(Circuit Court, W. D. Wisconsin. April 17, 1909. 169 F. R. p. 653.)

1. PATENTS—LICENSES—FORFEITURE.

Under a contract of exclusive license by a patentee providing for the payment of royalties, the making of periodical reports, and that in case of default on the part of the licensee the licensor might, on notice, terminate the contract, the failure to make reports at the specified times was not alone ground for such termination, where in several instances it was waived and reports made at longer intervals accepted without objection, and where by reason of extensive infringements and litigation respecting the patent, it was for a time considered of doubtful value by both parties.

2. PATENTS—LICENSES—CONSTRUCTION AND OPERATION.

A provision in an exclusive license contract under a patent that, in case the patent should be held not infringed by a certain manufacture by "any court of competent jurisdiction," the royalty should be reduced and limited in all to a certain sum, must be construed as meaning a decision which should finally settle the question of such infringement and a decision of noninfringement by a trial court, which was reversed on appeal, did not have the effect of reducing the royalty.

3. PATENTS—LICENSES—RIGHT OF FORFEITURE.

By an exclusive license contract under a patent it was provided that, on failure of the licensee to pay royalties to the amount of $3,500, at the end of two years, the licensor might terminate the contract on notice. At the end of the two years, such notice was given; the licensee having then paid royalties of about $3,450. The licensee had also expended a large sum in establishing a manufacturing business under the patent. The licensor was obligated by the contract to protect the validity of the patent and protect the licensee from infringements, but although one suit was finally carried to a successful issue, and a decision of the appellate court sustaining the patent obtained, other infringing articles were in the market which practically evicted the licensee from enjoyment of the patent right. Held, that under such facts a court of equity could not decree a cancellation of the contract.

WESTON ELECTRICAL INSTRUMENT CO. v. AMERICAN INSTRUMENT CO. et al.

(Circuit Court, E. D. Pennsylvania. March 20, 1909. 169 F. R. p. 659.)

PATENTS—SUIT FOR INFRINGEMENT — PRELIMINARY INJUNCTION.

While, as a general rule, an adjudication of the validity of a patent will be required as the basis for the granting of a preliminary injunction against its infringement, it will not be required where the patent has been sustained by the Patent Office in interference proceedings with defendants and on successive appeals therefrom is clearly one of merit, and it also clearly appears that one of the defendants to whom the invention was disclosed by the patentee fraudulently appropriated and patented it as his own.

SCOTT v. LAZELL et al.

(Circuit Court, S. D. New York. Jan. 21, 1909. 169 F. R. p. 661.)

PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A preliminary injunction against infringement of a patent will not be granted when the question of infringement is in serious doubt.

DENNING WIRE & FENCE CO. v. AMERICAN STEEL & WIRE CO. OF NEW JERSEY.

(Circuit Court of Appeals, Eigth Circuit. April 10, 1909. 169 F. R. p. 793.)

1. PATENTS— SUBJECT OF PATENTS—FUNCTIONS OF MACHINE.

The mere function or operation of a machine or other device, as distinguished from the machine or device itself, is not patentable.

2. PATENTS— SUBJECT OF PATENTS—PROCESSES.

A patent cannot cover generally any and every means or method for producing a given result.

3. PATENTS—SUBJECT OF PATENTS — MACHINES.

While the principle of a machine or device and the mode of its operation are required to be set out in the specification of a patent therefor, they cannot be made the subject of a patent, but only the machine or device itself is patentable.

4. PATENTS—SUBJECT OF PATENTS—"FUNCTIONS OF MACHINE."

The phrase "functions of a machine," as used in the patent law, defined as that power or property of the machine of acting in the specific manner designed or intended by its construction; in other words, that which the machine is designed to do, as distinguished from the machine itself, and from the product of its action on something external to itself.

5. PATENTS — CONSTRUCTION — GENERAL RULES.

A patent is a contract, and the rules for the construction of contracts generally control in its interpretation; and when its terms are plain, and the intention of the parties clearly manifest therefrom, they must prevail; but if its expressions are ambiguous, or its validity or any claim is doubtful, that construction will be given which will sustain rather than destroy the patent.

MOYER v. METAL STAMPING CO.

(Circuit Court, S. D. New York. March 20, 1909. On Rehearing, April, 5, 1909. 169 F. R. p. 825.)

PATENTS—ANTICIPATION—THILL COUPLING.

The Moyer patent, No. 591,561, for a thill coupling, held void for anticipation on satisfactory evidence that a device admitted to have all the essential features of that of the patent was made by another, and was in public use prior to the application for the patent.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Charles H. Bachmann, Guelph, Ont., Canada. Super for Bee Hives.—The object of this invention is to provide a novel, simple and thoroughly practical super of a knock-down character that can be separated and removed from the body sections and furniture of the hive, which can be separated with ease and the super quickly filled and placed in condition for application to a hive. Moreover, the structure will occupy but little space in storage. It comprises upright walls with hinged and detachable connections between the walls, said walls enclosing the hive furniture.

Arthur Atkinson, Davenport, Iowa. Radiator Shield.—In steam or hot water radiators, the upwardly moving currents of hot air soon blacken and discolor the walls above the same, and the object of this invention is to provide an exceedingly simple shield readily applicable to any radiator, said shield serving to deflect the currents of air outwardly into the room, thus preventing its bad effects upon the walls and at the same time securing better heating results. The shield is pivotally mounted on a standard which is detachably connected with a support secured to the radiator. The outer end of the shield is provided with a cushion strip to engage with the wall adjacent the radiator.

Fred C. Horak, Stuart, Nebraska. Mowers. — This invention relates to mowers of the wheeled type, adapted to be drawn by power, and has for its object to provide means for dropping the front end of the mower frame, independently of the tongue, to a point close to the ground, so as to bring the pitmen not only in line with, but in substantially the same plane as the cutter bar, to do away with the downward thrust or pressure and the consequent friction incident to the arrangement of the pitman at an inclination, whereby the mower is operated with greater effectiveness and with an expenditure of less power, while its durability is increased and the noise of operation lessened.

Charles E. Pomeroy, Salt Lake City, Utah. Device for Assisting in Teaching and Writing Music.—This invention has for its object to provide a device which will assist in writing musical compositions by visibly showing any and all intervals and chords, as well as illustrating the practicability of effecting chord successions, according to the rules of harmony, either in one common mode or from one mode to another. This object is effected by providing a miniature or dummy piano at such times and places where a real instrument might be objectionable or unavailable; and by the use of such dummy instrument, musical compositions may be quickly and readily analyzed according to the rules of harmony. The instrument will also aid pupils in the study of harmony, as distinguished from aid to the performance of music, vocal or instrumental, which aid is ordinarily placed on a keyboard as a guide to striking the chords.

John W. Harold, Burlington, Ind. Adjustable Stove Pipe Fastener.–This invention relates to a stove pipe fastener which is detachably secured to the stove pipe, and is provided with means for engaging the inner and outer walls of variously-sized chimneys, and its object is to provide a fastener having means for preventing the stove pipe from being inserted too far into the flue, and having a lock which will readily permit both the positioning and attaching of the stove pipe.

Samuel A. Jackson, Kittery, Maine. Sail Hank.—The object of this invention is to provide a simple and entirely practicable hank of few parts, that can be readily engaged in the grommet or eyelet of a stay-sail, jib, or the like, and as readily removed therefrom when it is desired to change sails, though effectively held against accidental displacement; and that will maintain the sail close to the stay, and constitute a self-rover which will not wear the stay.

Espey R. Donaldson, Sharpsburg, Ky. Poultry Feeder.—An object of the present invention is to produce a foldable poultry feeder, adapted to be compactly arranged when not in use, and capable of being readily transferred from one point or place to another, whereby a clean feeding ground may be obtained and better sanitary conditions maintained. By this device there is provided an enclosure in which young fowls may be fed and old ones cannot intrude, thereby lessening the mortality of young chickens and other fowls from being trampled upon in the struggle for food, and at the same time enabling them to eat undisturbed and at leisure, which results in better digestion and healthier fowls. The poultry feeder has means for varying the size of the entrance to suit the size of the fowls to be fed.

James M. Williamson, Moundsville, W. Va. Heating System.—One of the objects of the present invention is to provide a simple and efficient structure that can be readily fitted to any room and will constitute an effective heater by taking the cold air directly from the floor, and after heating the same will again deliver it into the room at a comparatively low point; that will occupy no more space in a room than the ordinary base board, and may be made ornamental, and if not extended completely around a room, can be continued by a correspondingly shaped casing that will form with the heater a complete and artistic base board. The structure is made up of sections, separately removable, so that they may be replaced by new ones if through injury and derangement any should become useless.

Henry T. Emeis, Salt Lake City, Utah. Cash Register Attachment.—An object of the present invention is to provide an attachment for cash registers in the form of a dial, and a hand adapted to operate over said dial by means of an electric motor and intended to be used as a medium for encouraging cash sales, by the salesman making the designations of such indicator under certain conditions advantageous to the purchaser, said attachment being operated by the keys of the register, and adapted to be attached to any cash register of well known construction.

Ira F. Gilmore, Bloomington, Ill. Wireless Piano.—An object of the present invention is to simplify the construction of the modern piano by dispensing with the wires or strings, which are so universally used, and substitute in place thereof reeds, sound-emitting forks or tongues, so as to obviate the constant tuning of the instrument as is now the case with the stringed piano. A further object is to provide a series of prongs or tongues adjacent to the sounding board, which when vibrated by the action of the well known piano hammer, will give forth a soft mellow tone similar to that produced by the harp. In practice, single tongues may be employed for each key, or a plurality may be operated on by each key, and these tongues may be constructed of different metals, or a combination of different metals, to produce the best possible tones.

Richard M. Holland, Elkton, S. D. Smut Machine.—An object of the present invention is to provide a novel, simple and efficient means for separating the chaff or smut from grain. The invention comprises a tank adapted to contain water, into which the unseparated grain is placed, the heavier particles or good grain falling to the bottom of the tank, and being taken out by mechanism in the form of an endless belt, while the chaff or smut which floats on the top of the liquid is removed by a separate mechanism. A device for drying the chaff or grain thus separated is also included in the machine.

Silas E. Bailor, Tarkio, Mo. Draft Equalizer.—An object of this invention is to provide a draft equalizer, designed particularly for use on two-row culivators to enable three horses to be arranged abreast, and capable of equalizing the draft between the same. To this end the draft beams are arranged over two rows of plants, and the equalizing levers are disposed so that their pivots will be located a sufficient distance beyond the draft beams to equalize properly the draft between the central and side horses, and afford plenty of room for the side horses.

Alexander Burrows, Woodward, Okla. Two patents.—The first patent relates to a whip operating device designed for use on vehicles, agricultural machinery and the like, and adapted to enable the whip to be adjusted to position it properly with relation to the horse, or other animal to be whipped, and then oscillated to apply the whip to the animal. The whip after being adjusted to the desired position is automatically locked in such position, so that it will be only necessary to oscillate the whip and not at any time hold it in position, thereby affording greater freedom to the driver for controlling the team.

The object of the second patent is to provide an efficient grappling bucket, designed for cleaning drilled wells, and adapted for removing foreign matter such as dead animals, pieces of iron, and other objects from the bottom of a well, in addition to removing sand and mud.

Lute E. Campbell, Tulsa, Okla., inventor; Claude Thornton, and Alexander F. Davis, Joplin, Missouri, assignees of the first patent; Levi W. Lindsey, Tulsa, Okla., assignee of the second patent. Two patents.—It is the aim of the invention of the first patent to provide a nut lock, designed particularly for use on rail joints, and adapted to be readily applied to a nut to prevent the same from accidentally unscrewing, and to be readily disengaged from the nut when it is desired to remove the latter from its bolt.

The second patent relates to a railroad spike, equipped with means for locking the spike against both upward and backward movement, whereby the rail will be prevented from spreading and the spike from becoming loose. The spike is provided with an inclined tapered brace which cooperates with an enlargement formed on the shape below the head.

David H. Callahan, Westbrook, N. C., inventor; Simon A. Lewis and Gaston C. Lewis, Kelly, N. C., assignees. Cotton Chopper.—An object of this invention is to provide a cotton chopper of light construction, adapted to be easily handled by the driver, and equipped with means for enabling the cotton chopping mechanism to be readily thrown into and out of operation without stopping the team, whereby there is produced a cotton chopper capable of effectually blocking out or thinning cotton plants, and adapted also to cultivate the same by throwing the soil inwardly against the plants.

Richard D. Farrell, Tyrone, Pa. Two patents—The first patent relates to an automatic safety appliance, adapted to be easily installed on railroads, and capable, should an engineer attempt to pass under a danger signal without stopping, of automatically venting or bleeding the train pipe of the air brake system, and sounding the whistle signal within the cab of the locomotive and also displaying or lighting an electric light in front of the engineer, so that he will, if alive, have his attention called to the danger signal and, if dead, will have his engine stopped by a complete application of the brakes. A further object of the invention is to maintain the air brake bleeding valve in an open position until the train is brought to a stand still, and then automatically reset the appliance and permit the brake valve to close.

It is the aim of the invention of the second patent to secure an operation of the safety appliance with a less reduction of train pipe pressure than with the safety appliance of the first patent, and to enable the air brake bleeding valve to be closed by the engineer without leaving his cab, and to utilize the air escaping through said valve to operate the signal whistle.

Jacob Fisher, Roann, Ind. Three patents.—The first patent covers a woven wire fence clamp, adapted to readily crimp heavy strands or line wires, whereby the clamp is effectually prevented from slipping when in operation and when the fence wire is stretched to a high tension.

The second patent relates to a wire stretcher, designed particularly for stretching woven fence wires, and capable of being readily operated for enabling the wire to be stretched successively. Another object of the invention is to improve that class of wire stretchers employing a longitudinal screw and a rotary nut, and to prevent lateral strain and binding of the parts when the device is exerting considerable power in stretching woven wire fencing, or in analogous stretching or pulling operations.

It is the aim of the invention of the third patent to provide a woven wire fence clamp of comparatively light structure, capable of crimping heavy strands or line wires and of preventing the same from slipping, and equipped with a central draft connection, adapted to equalize the strain on the clamp and prevent the same from concentrating at one point.

James Grieve, Wichita, Kan., inventor; Harry L. Hubbard, Dodge City, Kan., assignee. Check Holder. It is the aim of the present invention to provide a check holder, designed for the use of conductors on passenger trains, and adapted to adjust itself automatically to the number of checks contained in it, and capable of holding the checks uniform and of permitting them to be readily removed as required. Another object is to expose the ends of the checks to enable the number and date to be written on them, and to permit checks of two colors to be used and exposed for use in connection with local and through passengers. A further object is the provision of means for holding two record checks or slips, for keeping tally on the checks issued by a conductor.

NEW PATENTS FOR SALE.

Advertisements inserted in this column for 10 cents a line (about 7 words) each insertion. Every new subscriber sending $1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

FOR SALE on royalty—U. S. Patent No 949,694. Brush Cleaner for Carpet Sweepers. Address, Armor & Collner, St. Petersburg, Pa. aug

FOR SALE—Patent No. 648,231. Pruning Implement. Especially adapted for picking the brown-tail moth nests. Will sell outright. If interested, address, Charles I. Libby, R. F. D., Sanford, Maine, aug

FOR SALE—Patent No. 945,762, granted Jan. 10, 1910. Folding Harness Support. Folds automatically as soon as harness is removed. Write for particulars, William W. Dieleman, Lost Springs, Wyoming. aug

FOR SALE—Patent No. 888,394. A spoke-setting machine adapted for repair work. Can be used in factory. Is accurate and a labor-saving device. Will sell reasonable. Address, E. E. Foxworthy, Flemington, Mo. aug

FOR SALE or Trade—Patent No. 952,154. Lace Curtain Pole. Curtain held in position without rings or pins. Ornamental as well as useful. Will sell outright or part cash and royalty. Address, W. L. Thurber, Shellrock, Iowa. aug

FOR SALE—Patent No. 946,418, dated January 10, 1909. Combination switch and lightning arrester. This is the best invention of the age for use on telephones. Will sell for part cash and balance on trade. Address, Wood & Thoma, Lookeba, Okla. aug

FOR SALE—Patent No. 949,128. Rubber Book Protector. Adjustable, useful and ornamental in any beautiful design. Little cost. Will sell any state or Canada rights. Want to hear from manufacturers for cash or royalty. Address, Miss B. C. McAndrews, Merrill, Maryland. aug

FOR SALE—U. S. Patent No. 934,899. I will sell outright, or have manufactured on a royalty, my reversible ratchet wrench. Write for drawing and specification. Something new. Address, Fred W. Eilart, No. 504 Parker St., McKeesport, Pa. aug

FOR SALE—If you wish to buy valuable patent, on simple and saleable device, address, A. H., care Templeton & Agerton, Fort Worth, Texas. jy

FOR SALE—Patent No. 946,611. Burglar Proof Window Lock. Very valuable invention. Can be manufactured at small cost. Article in demand every where. Will sell outright or for part cash and royalty. Address, Grace McFarlane, 211 North Winnebago St., Rockford, Illinois. jy

FOR SALE—Button Fastener, Patented Jan. 25, 1910. It talks for itself. Consists of staple and ring. Will not come out or tear cloth. Will sell, trade, royalty, stock interest or organize factory. Address, J. L. Nelson, Clarksville, Ark. jy

FOR SALE—Patent No. 944,126, issued Dec. 25, 1909. A can opener that can be fastened to a wall or table and be stationary. Can open same by means of a crank. Just the thing for hotels, restaurants and boarding houses. If interested state your price in first letter and address, Medos Desotell, No. 331 West Fisher St., Marquette, Michigan. jy

FOR SALE—U. S. Patent No. 949,388, dated Feb. 15, 1910. Container and grater combined. No more germs for the kitchen. Part cash or royalty or outright. Canadian patent applied for. Address, Mrs. C. Winlack, Niles, Michigan. jy

FOR SALE—U. S. Patent No. 946,419. Folding Shipping Crate. For full particulars address, Adolf Wyss, Brandsville, Mo. jun

FOR SALE—Patent No. 919,116, dated April 20, 1909. Trap. One that catches and kills. Also Canadian patent. For particulars write, Henry Barber, R. F. D. Olmstead, Illinois. jun

FOR SALE—Patent No. 939,855, on a Dry Clay Gathering Machine; either outright or on royalty. Address, C. E. Olden, No. 620 North Main St., Mason City, Iowa. jun

FOR SALE—Patent No. 621,154. Cow Tie. Will permit an animal great freedom when grazing. Will sell on royalty basis. Address, P. T. Pederson, Box 161. Milnor, North Dakota. jun

FOR SALE—Patent No. 938,528. Combined tie lifter and holder used in railroad construction. No reasonable offer refused. Address, Thomas Warren, Palenque, Via Colon, Republic of Panama. jun

FOR SALE or royalty—U. S. Patent No. 952,951, issued Aug. 31, 1909. Wrench. No screws, springs or teeth to play out. Strongest, cheapest and handiest wrench on the market. Address, A. R. Bell, Evesham, Via Macklin, Sask., Canada. jun

FOR SALE on royalty—U. S. Patent No. 989,828. Tap screw plug, for plugging leaks in range boilers or pipes. Address, E. A. Gehrke, No. 330 North 13th St., Lincoln, Nebr. jun

FOR SALE or on royalty—U. S. Patent No. 949,310, dated Feb. 15. 1910. This invention relates to a detachable button which is useful for all kinds of garments. Can be put through between the goods and locks itself. Can be taken off without leaving any mark. Also useful for uniform garments. Canadian patent applied for. Address, Joseph Tams, No. 208 Mulberry Street, Trenton, N. J. jun

FOR SALE—Patents Nos. 916,868, dated March 30, 1909, agricultural implement; Patent No. 911,983, dated Feb. 9, 1909, belt replacer; and 911,876, dated Feb. 9, 1909, cultivator. Inventions also covered by Canadian patents. Will consider proposition for royalty, or will exchange for land and part cash. For further particulars address, John Horinek, Atwood, Kansas. jy

FOR SALE—Patent No. 934,571, Automatic Dip Tank for all kinds of stock. Stock go under tank and get dip on back, runs all over them. Protects stock from flies and all insect pests. Set in pasture in front of stall. Address, E. M. Reckards, Ozawkie, Kansas. jun

FOR SALE—Patent No. 939,246, dated Nov. 9, 1909. Whip Socket. Locks securely by downward pressure on whip handle. If interested write for copy of patent. Address, R. Habekost, Squirrel, Idaho. jun

FOR SALE or Trade—Patent No. 922,740. Just put on the market. A money maker. Plenty of territory. Write for full particulars. Address, Wells & Meek, Lock Box 385, Kahoka, Mo. jun

FOR SALE—Patent No. 932,806, Aug. 31, 1909. Collapsible Box. Can be used for egg cases, fruit cases and boxes too numerous to mention. Will sell same at a reasonable price. Address, Oscar A. Paulson, River Falls, Wisc. aug

FOR SALE—Patent No. 583,494. Combination Book-Shelf and Book-Support. An excellent support. Easily applied to fit any shelf and books. Reasonable price. Address, August Lundberg, 41 Catherine St., Worcester, Mass.

FOR SALE — The best Can Opener on the market, patented December 24, 1907, patent No. 874,457. Will sell outright at reasonable price. Would like to hear from any one who buys patents. For further information address, L. P. Therriault, Bonfield, Ont., Canada. my

FOR SALE — Patent No. 947,455. Combined Cultivating and Insect Destroying Machine. A necessity to potato growers, as it works without the use of poison. Will sell outright: reasonable. Address, Joseph Peil, Bloomer, Wisc. jun

FOR SALE—Patent No. 642,404. Cross Line Buckle. Will admit of attaching or detaching short check at will. Can be attached to long line any place without pulling the end through. Can be manufactured as cheaply as the ordinary kind. Very strong and durable. Will sell outright or place on royalty plan with reliable firm. Address, H. P. McGowan, Hurley, Okla. jun

FOR SALE—U. S. Patent No. 889,151, granted May 26, 1908. Street Car Fender. Has telescoping section to save persons struck by moving car. Address, H. M. Prater, Box 27, Crocker, Missouri. jun

FOR SALE—U. S. Patent No. 943,454, granted Dec 14, 1909; Canadian Patent No. 123,625, dated Feb. 1, 1910. Mothers Sewing Companion. The primary object of the invention is to provide a portable stand that will serve the purpose of a pin cushion, work basket and shelves for toilet articles. All in a compact form. The shelves may be rotated until the desired article is within reach of the operator without the latter changing her position. Address, S. Pecoy, Cresco, Iowa.

WANTED.

WANED—To buy or manufacture on royalty a meritorious patented article. One in general demand preferred. Will deal with inventor only. Give description, terms and conditions. Address, Manufacturer, P. O. Box 754, Chicago, Ill. jun

WANTED—To correspond with patent owner of an article of merit, always seasonable, not perishable, and marketable any place. We manufacture and sell. Address, W. H. Davis & Sons, Newark, Ohio. jun

WANTED—A company to buy or manufacture on royalty our automatic car coupling, U. S. patent No, 933,924, and Canadian patent No. 111,381. The best automatic coupling ever invented. Address, George Sarrazin & Hector Perreault, No. 653 Canal St., Holyoke, Mass. jun

WANTED—Financial assistance in protecting and exploiting five inventions having originality and merit which will commend them to the countries of the world. Liberal interest will be given in the patents to be procured in exchange for the capital necessary for the making of models, incidental and other expenses. For full particulars address, John Horinek, Atwood, Kansas. jy

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Shall Caveats be Abolished?

There is a bill pending before Congress (H. R. 19389) proposing to abolish section 4902 of the revised statutes, bearing on the filing of caveats in the United States Patent Office. This section reads as follows:

"Any person who makes any new invention or discovery and desires further time to mature the same may, on payment of the fees required by law, file in the Patent Office a caveat setting forth the design thereof and of its distinguishing characteristics and praying protection of his right until he shall have matured his invention. Such caveat shall be filed in the confidential archives of the Office and preserved in secrecy, and shall be operative for the term of one year from the filing thereof; and if application is made within the year by any other person for a patent with which such caveat would in any manner interfere, the Commissioner shall deposit the description, specification, drawings and model of such application in like manner in the confidential archives of the Office and give notice thereof by mail to the person by whom the caveat was filed. If such person desires to avail himself of his caveat he shall file his description, specification, drawings and model within three months from the time of placing the notice in the postoffice in Washington, with the usual time required for transmitting it to the caveator added thereto, which time shall be endorsed on the notice."

Generally speaking, the object of filing a caveat is to protect an inventor in his invention while he is experimenting with and completing it so as to get it in shape for an application for patent. The patent statutes have had a provision of this sort since 1870. Canada, whose patent laws are copied from those of the United States, also provides for caveat protection. In England, and most of the English colonies, they have what is known as provisional protection, which covers a period of six months and somewhat resembles that afforded by a caveat, but differs therefrom in that the protection is not secret, and the inventor, when he makes an application for patent, cannot introduce any new idea not included in the provisional protection.

It often happens that an inventor may conceive of the possibility of making a certain device, but not being skilled in mechanics and not thoroughly conversant with the subject to which his invention relates, he desires to enlist the co-operation of others in order to make a thorough investigation before applying for patent. Before disclosing the device to third parties who might take advantage of the disclosure, he naturally desires to protect it in some way, and it is for this purpose that a caveat is valuable. Again, an inventor may not have enough money to file an application for patent, and yet may wish some form of cheap protection while he is seeking assistance from a manufacturing company. Wishing to determine the value of the invention, as well as the best mode of carrying it out, he files a caveat at a cost of $15 if he presents it himself, or $25 if the work is done through an attorney. The caveat papers simply consist of a drawing, if the invention can be illustrated, together with a description, and if desired a claim setting forth the particular features that he regards as novel. It is not absolutely necessary that the specification should have a claim, but it is advisable in order that the examiner, in reading the caveat papers, may have his attention attracted to the special feature which the inventor wishes protected.

When the caveat is filed in the Patent Office, a certificate is given the caveator. The protection runs one year, but may be renewed yearly at an extra expense of $10. During the one year term or any extension thereof, should an application for patent be filed on the invention described in the caveat, such application is withheld from issue as a patent, and the caveator is notified to complete his application for patent within three months. If at the end of this period the caveator fails to apply for the patent, the application for patent which in the meantime has been suspended from action, is immediately passed to issue, and a patent granted. If, however, the caveator files his application for patent, an interference is declared between the first application and his own, and the question of priority is determined in the regular way. In such a contest the caveator is placed at a slight disavantage because of the later filing date of his application for patent; but this is partly offset by the fact that the caveat affords evidence of conception of the invention.

It is sometimes very difficult to prove conception, as inventors as a rule are secretive. Cases have been known in which they have failed to disclose their inventions to anyone before filing applications for patents. When, however, a caveat has been filed, the fact of filing it enables the inventor to show conclusively the date of conception, even if he has no other proof than this. As conception must be proved in an interference contest, it will be seen that the small cost of filing a caveat would more than be recovered in its value as evidence, for it would cost the inventor considerably more than $10 to take the testimony of a corroborating witness, and such testimony would not be regarded as nearly so conclusive as that offered by the filing of a caveat.

In view of these facts, it seems to us that the proposition to abolish caveats is unwise, During the year 1909, there were 1948 caveats filed in the Patent Office, which shows that there is a large number of inventors who appreciate this provision of the statutes. In each of these cases $10 was paid into the Office, making a total of $19,480 from this source. As there are no examinations made by the Patent Office to determine the novelty of inventions in caveats, and it is only required that the examiner should read the papers and keep the construction in mind while it is in force, it is plain that looking at the matter from the Patent Office standpoint, caveats are a considerable source of revenue to the government, and involve very little trouble. We venture to assert that they do not take $5 worth of time from the date of filing the caveat until the end of the term. In an application for patent, the government gets only $5 more, yet the time of the examiner in considering it often amounts to four or five times as much. For this reason, we do not see why the Patent Office should be anxious to do away with caveat protection. Caveats do not delay the work of the examining divisions. While in some instances they may have been overlooked in issuing patents, the same thing can be said of applications for patents which have also been overlooked, and patents granted to other inventors on similar devices.

We believe there is a demand for the caveat section of the statutes, and if inventors could be heard from, they would object to having it abolished. Conditions at present in this line are substantially the same as they were in 1870, when the caveat section was incorporated in the statutes, and there is just as much need for a caveat now as then. If inventors were required to file applications for patent instead of caveats, the examining divisions would have just so many more patent applications to consider, and the inventions would be in such poor shape for consideration that much time would be lost in passing upon them. The caveat section provides means by which an untried and incomplete invention may be placed in the Patent Office at small expense, and immediate protection secured to the owner. The officials are put to little trouble to keep the caveat on file, and viewing the matter from every standpoint, it would seem that there is not sufficient reason for abolishing the caveat section of the statute. It was said in one of the hearings before the House Committee on Patents, "It is known that many inventors are led to believe that a caveat affords some protection against infringement which it does not." The same argument can be made against an application for a patent. Many inventors think that putting "Patent Applied For" on an article after application has been made, affords them some protection. Following the same reasoning, we should declare that applications for patent should also be abolished. Because an inventor here and there has a wrong impression about the purpose of a caveat, should the experience of forty years as to the wisdom of this section be thrown aside, and inventors be deprived of this form of protection? What if they do get an erroneous impression? Does it harm them? It seems to us that the thing for the Patent Office to do is to endeavor through its official publication, the Gazette, or in some other way, to educate inventors to a better understanding of what caveats mean, rather than to abolish them, when there is seen to be a need for such protection. It is not the large manufacturing companies that make use of caveats. They can afford to, and they do, flood the Patent Office with applications for patent. It is usually the poor inventor who files a caveat, and we do not think this privilege should be taken from him. If it affords no real protection to the inventor, as alleged, it is partly the fault of the Patent Office, in not paying greater attention to the caveats. We have known of cases where these have been ignored or overlooked, and patents allowed to go out in which caveators should have been notified. If the Office would give closer attention to caveats, the inventor would get the real protection designed to be conferred by the statutes. We hope the bill will not pass, and ask our readers to use what influence they have to prevent its passage.

The Condition of the Work in the Patent Office.

There has been so much loose talk about the work in the Patent Office being in a satisfactory condition, and being current at the present time, that we think it best to make clear exactly what the situation is. In the official report of the condition of the 42 examining divisions at the close of business April 26, 1910, the total number of applications awaiting action was 18,978. The oldest new case was filed Nov. 27, 1909, and the oldest amended case was amended Jan. 27, 1910. In other words, there is a division in the Patent Office in which there are now being considered applications filed as far back as Nov. 27. There are four other divisions which are considering cases filed in December. Thus it will be seen that there are five divisions in which an application has to wait fully five months before the first official action is taken. When an application is amended it again takes its turn, and as already stated, there is a division where such amended applications are as far behind as Jan. 27, or nearly four months in arrears. If an application has to wait four or five months for its first official action, and three or four months for each action on an amendment, it does not take long for a year to pass, and a year is a considerable period for an inventor to wait, to determine if he is going to get a patent.

Many lose heart, and what is worse from a practical standpoint, lose chances to sell their inventions because of this delay. Just who is responsible for this condition is not clear. We sometimes think that certain examiners waste time in making technical objections, which might profitably be omitted. But it is idle for an outsider to try to place the blame when the Commissioner himself finds it impossible to do so. We have before us a copy of an order which has been sent to the various examining divisions of the Office, and we deem the matter of sufficient importance to print it in full:

April 8, 1910.

ORDER NO. 1850.

In view of the arrearages in the work of some of the examining divisions of the Patent Office, and for which condition in most instances there is no reasonable excuse apparent:

It is directed that no leaves of absence be granted to any examiner in any division until all the work of examining applications in such division is within thirty (30) days, in both new and amended cases, of the date upon which the application for leave is made.

It is further directed that no leave will be granted to the examiner's clerk and stenographer or typist for the same month.

It is further directed that at least one responsible employee be present at all times during office hours, including the lunch period, in each examining and each clerical division, and in each annex to any such division, unless the latter be securely locked.

This order will be strictly enforced.

(Signed) E. B. MOORE,
Commissioner of Patents.

We shall follow with interest the time intervening between this date and the vacation season, to see what effect this order has on the work. Of course the work can be put through rapidly by the examining divisions, in a careless and indifferent manner. We are rather inclined to think that the effect of this order will be that many examiners will slight the examinations, and let cases go out which should not be permitted to pass, or reject them, when careful study might result in their allowance. It has always been the case in the past that pressure of this kind has not been beneficial. Yet there is always a demand that pressure be applied to stimulate the work. It is a difficult problem for the head of the Office, and no Commissioner in our experience has ever been able to solve it. Various schemes have been tried. One Commissioner issued an order that every examining division over 30 days behind with its work should remain on duty until 5 p. m., instead of leaving at 4:30, as usual. The drawback about such orders is that the hard working, industrious man is made to toil even harder, if possible, while the man who has a pull, and feels that he can afford to be independent of the Commissioner, continues to do as he pleases. We should like very much to have this problem settled. Every now and then increases are made in the examining force, in the hope and expectation that these will improve conditions, and make it possible to keep up with the work. But the Office simply absorbs the new men and continues on its customary path. What the effect of this new order will be, the future only can tell. There is an old saying that blood cannot be extracted from a turnip, and the Commissioner cannot compel men who are working as hard as they can to put on extra steam and accomplish more. We fear this order will simply have the effect that such orders have had in the past —to cause the work to be slighted and add to the burdens of the attorneys in the prosecution of applications for patent. For the painstaking, conscientious examiner (and there are many of them in the Patent Office) we have the highest respect. There is not a better and higher class of men anywhere than in the Patent Office: but there are drones and idlers there as everywhere else, and unfortunately it is only too true that these often get credit for the work of others, while they waste their own time, and retard the work besides.

Electric Feeding Trough.

The description of an electrically operated feeding trough for horses appears in a recent number of *Popular Mechanics*. A man who did not want to get up early in the morning, but desired to have his horse fed promptly, arranged a feed trough with compartments for corn and hay, with a hinged, slatted lid, provided with an electric door opener. This lid was arranged to be pulled up by means of a cord and weight. Wires were run into the house to near the head of the bed, where they could be conveniently reached, and connected with a push button. On awaking in the morning, the owner could press the button, and the lid on the trough would fly up, exposing the feed to the waiting animal.

Moving Platforms Made Practical.

For many years there has been discussion of the question of building a series of moving platforms for the transportation of people, to take the place of street car lines; but hitherto none of the municipal authorities have cared to experiment with the device. New York, however, which is always struggling with the transportation problem—growing more and more urgent as the congestion of the metropolis increases—has at last determined to try this new method, and has authorized the public service commission to lay out a moving platform subway under Twenty-fourth Street, between Second and Ninth avenues. It is considered that this method of transportation, which is nothing more than a ball conveyor, is the most efficient known. It consists of short lengths of platforms, coupled together, forming an endless chain which is kept in continuous motion. In the Thirty-fourth Street subway there will be four parallel rows of platform, the first, adjoining the station platform, moving at the rate of three miles an hour, the next at six miles, the next at nine, while the fourth, which will be entirely covered from end to end with seats, will move continuously at twelve miles an hour. Entrances to the moving platform subway will be placed at every intersecting avenue or street. The capacity will be 73,500 seated passengers per hour in one direction during the rush period, as against 12,000 seated passengers on the express service of the subway and 7,500 on the local service of the same; and as against 36,000 standing and seated passengers per hour on the express, and 22,500 on the local service.

Beating Gold.

Gold leaf is one of the few products which machinery has not been able to produce. Although the demand for it much exceeds the supply, and the method of manufacture by hand is slow and primitive, and although apparatus of marvelous delicacy has been adapted to other industries, this remains a department where it plays no part. Apparently, machinery will be forever knocking in vain at the door of the gold beater.

Gold leaf as thin and fragile as any made today has been found in the coffins of Egyptian mummies, which must be at least 3000 years old, and in all that period practically no improvement has been made in the art of beating out to a thin film this most ductile of precious metals. In admiring the product of the modern gold beater, one must be still more astonished at the skill which the ancient peoples showed in achieving like results in an age when civilization was supposed to be at a low ebb.

The ductility of gold may best be appreciated by poising a small cube of five-eighths of an inch on the thumb, and then estimating the amount of space it will cover when hammered and expanded. Such a cube would cover the floor of a room 12 feet square, or 144 square feet. In the hands of the clever gold beater, a piece of metal no larger than a pin head can be flattened so that it will cover 25 square inches. This work is done by a hammer which to the observer looks more suitable for driving heavy spikes. There are several hammers used for the different operations, the largest of which weighs 18 pounds and the smallest seven pounds. With these apparently unwieldy instruments the gold beaters produce the wonderful filmy substance sold as pure gold leaf.

When the work is finished the small cube of gold is reduced to a thickness, or thinness, of one two hundred and eighty thousandths of an inch. The mind can scarcely grasp the full meaning of that unless comparison is made with some other material of common use. It means that it is at least one thousand times thinner than the paper on which this is printed. So thin is the gold leaf that in booking it the operators have to use slender wooden pliers to pick up the sheets.

Gold 23 to 24 carats fine is used as the standard of purity for gold beating, and goes to the operator in the form of a solid ingot one inch wide, five inches long and three-sixteenths of an inch thick. It is first slightly heated and then passed through steel rollers which transform it into a ribbon from 7 to 8 yards in length and one inch wide. The steel roller is the only suggestion of a modern machine used in the whole process, and to this extent the work may differ slightly from the art as practised by the early Egyptians. This ribbon is cut into one inch sections and placed between leaves of very tough paper. The package thus formed is called a kutch, and contains from 180 to 200 sheets. This kutch is placed on a solid anvil, and the operator begins hammering it with an 18-pound hammer with a convex surface 4 inches in diameter. For half an hour this hammer is wielded rapidly and skillfully, until the leaves have been spread to four times their area. Then they are cut into four squares, and new books filled with them. There are seven hundred and twenty of the leaves of gold now, and they are placed between vellum instead of paper and beaten for two hours with a hammer slightly smaller than the first.

The gold beater works like an automaton, shifting the hammer from hand hand without once making a miss. Each blow must be carefully directed, for the gold must be hammered evenly and uniformly throughout. This book, which is called the shoder, reduces the gold leaves sixteen times thinner than the original ribbon. The original one hundred and eighty leaves are now cut into twenty-eight hundred and eighty.

The final beating is then begun. In this stage of the process the utmost skill must be displayed, for a false blow of the hammer might easily tear the leaves. Neither paper nor vellum can be used to separate the gold leaves in the last hammering, and the only satisfactory substance ever found is the large intestine of the ox. The preparation of the intestines for this work is peculiar. When stripped off in lengths of 2 or 3 feet they are freed of grease by special treatment with an alkali solution. Next they are thoroughly cleaned and doubled over so they stick and unite together. Various chemicals are then applied to increase their toughness, after which they are ready for the gold beater. Although very tough and durable the skins can be used for only about 200 beatings, and then new ones must be employed. The expense of the skins can be appreciated when it is stated that for one mold upwards of 350 to 500 oxen must be slaughtered. In fact, the skins are more expensive than the gold leaves placed between them, $45 or $50 being often paid for the skins for a single mold.

With the gold leaves placed between the skins, the operator beats the package for upwards of four hours with a seven pound hammer, and at the end of that time the gold is of the standard thickness used for decorative purposes. The leaves are put up in books, each containing 25, and twenty books make a package of five hundred leaves. The original ingot of gold has thus been converted into eighty books of 25 leaves each.

An important consideration in gold beating is the recovery of the waste. There is a specified amount which must be recovered by each workman from the trimmings and scraps, and for all that one returns above this he gets one dollar a pennyweight. Gold beaters generally work with bare arms, and wash thoroughly after each days work, brushing their clothes and hair to recover the gold. There are 20 to 25 gold beating establishments in this country, mostly located in New York and Philadelphia, and about 200 workmen are employed in them.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Headlight, Automobile-.....W. H. Tonne
Heating-furnace.....W. Fisher
Hinge.....C. Bartels
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Holdback.....W. J. Parvin
Horn-support.....E. L. Aiken
Horseshoe.....A. Myer
Humidifier.....F. B. Comins
Hydrocarbon-burner.....J. L. Henry
Ice-cream freezer.....G. F. Dickson
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Illuminating and projecting apparatus, Solar..W. T. Skilling
Incinerator.F. L. A. S. and L. A. R. Decarie
Inkstand, 2 pats.....J. J. Hoey
Internal-combustion engine.....L. F. Sleade
Iron, Melting and refining.....H. Johnson
Ironing-board.....A. M. Garman
Ironing-stand.....W. Bennett
Jack.....O. B. Mueller
Jack-block.....J. A. Gray
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Jewel-mounting.....Z. White
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Ladder, Extension-.....J. A. Johnson
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Lamp-burner.....H. J. Ballentine
Lamp receptacle for electric signs, Electric.....F. W. Ruby (Reissue)
Lamp socket, Electric.....J. G. Peterson
Lanterns, Slide and shutter operating device for magic.....J. Oldfield et al
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Linotype-machines, Time-controlled heating system for.....A. A. Hill
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Malting or drying grain or the like, Drum for.....B. Nissen
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Paper bags, Machine for making block.....A. Henderson
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Plug, Clean-out.....C. F. Madden
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Rotary engine.....J. F. Milton
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Sewing-machine gage.....J. L. Kleinman
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Trousers-fastener.....J. B. Fincher
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Truck for locomotives, Swing-..W. L. Austin
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Tug and buckle.....J. Raisbeck
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Turbine, Radial-flow steam-.W. H. Evermann
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Type-writing machine.....C. E. Tomlinson
Type-writing machine.....E. F. Kunath
Type-writing machine inking device.....H. H. Angell
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Universal joint.....P. H. Breed
Vacuum cleaning device, Portable.J. Gardner
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Valve.....J. A. Donnelly
Valve-actuating mechanism for gas-engines.....V. W. Potter
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Valve, Engineer's.....W. H. Lieber
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Valve, Indicator-post for.....E. H. Whitney
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Dust and ash removing devices, Suction-nozzle for.....E. Pannenborg
Dust-collecting apparatus (reissue).....G. R. Bimm
Dyes soluble in water, Compound of sulfur.....E. Haussmann
Electric heater and cooking apparatus.....F. C. Perkins
Electric-light supportiug-bracket.....J. P. Hebendahl
Electric machine, Inductance-neutralizing coil-wound core and commutating impedance-coil for.....W. E. Goldsborough
Electric-time-switch mechanism..A. B. Shaw
Electrical plug-receptacle....G. B. Thomas
Elevator deviee.....R. L. Garnet
Elevator-door locks, Means for operating.....J. E. Boyee
Embroideriug-machine.....R. Zahu
Emery-wheel stand....S. W. Baumgardner
Engine-cylinders, Water-jacket for.....E. B. Parkhurst
Engine Starting device, Explosion-.....G. M. Davis
Engines, Lubricating system for.....A. J. Liberty
Envelop.....S. D. Chelf
Envelop, Safety-.....C. Nielsen
Envelops, paper bags, or the like, Plant for the mauufacturer of.....R. E. Fischer et al
Excavator.....W. P. Beaver
Exercising device.....W. P. Armstrong
Expansion-bolt.....W. A. Bryant
Explosive-engiue.....R. P. Thompson et al
Explosive mine.....A. J. Strotzka et al
Eyeglasses.....F. W. Nolte
Fan, Oscillating.....A. Rubin
Fan, Oscillating electric..C. R. Meston et al
Faucet.....C. Ayo
Feed-regulator.....M. Dnrst
Feed-water heater aud purifier, Boiler.....W. J. McKnight
Feed-water purifier.....F. E. Keyes
Feeder, Poultry-.....F. Enos Jr
Feuce-post.....C. D. Voris
Fence-post.....W. B. and L. A. Henning
Fibrous material, Treating..R. R. Roberts
Fibrous material, Treating..R. R. Roberts
File, Document-.....J. L. Bieder
Filter.....G. L. Allen
Fire-extinguisher...M. C. Fairweather et al
Firearm for hand and automatie loading..R. Frommer
Fireproof structures, Temporay support for the filling of.....R. B. Higgins
Fish-hook, sinker, and line-fastener, Combined.....F. Harkins
Fishpole-handle and weighiug-scale, Combined.....E. J. Weldon
Fishing apparatus.....C. G. Jorgensen
Fishing-reel.....J. W. Diamond
Flashing.....I. R. Taylor
Float.....A. W. Ayliug et al
Flume-gate.....M. H. Worley
Fly-trap.....W. C. Logan
Flying-machiine, Amusement..R. G. Dressler
Folding and delivery mechanism..W. Scott
Folding box.....A. Goldeuetz
Folding box.....A. Goldenetz
Food-cutter.....J. Anderson
Frogless switch.....S. Miller
Fruit-gathering vessel.....J. H. Ogburn
Fruit-washing machine.....J. F. Haller
Fume-arrester.....C. C. Whitmore
Furnaces, Means for facilitatiug the removal of accumulations in the pipes and elbows of.....E. Paunenborg
Game apparatus.....R. Sato
Game apparatus, Educational.....E. G. Sanderson
Game-counter.....A. McKiuney
Garbage-crematory.....J. A. Thompson
Garment-hanger.....J. B. Brochu
Garment-supporter.....M. F. Burns
Garment-supporter.....S. J. McClung
Gas apparatus, Producer-.....H. P. Hill
Gas from liquid-hydrocarbou fuels, Makiug fixed.....H. A. Grine
Gas-governor.....M. Lees
Gas-main stopper.....E. A. Behringer
Gas-meter, Single-diaphragm....A. Heuning
Gate.....W. E. Reed
Generator.....J. J. Weyer
Glass and making the same, Art.....W. Johnson
Glass-heating furnace.....T. W. Frech, Jr
Glassware, Manufacturiug.....M. W. Kaye
Go-cart, Convertible.....R. S. Stone
Golf-ball marker.....J. J. Blumberg
Grindiag machine, Saw-..F. A. Hunter et al
Grinding-mill.....E. T. Lansdowne
Grinding or polishing articles, Apparatus for.....G. and G. Krohn
Gun.....F. B. Pattersou
Gunpowder, Manufacture of....J. Luciani
Gyratory machine.....J. Fraser
Hair ornamenting or holding device.....J. McArthur
Hair, Teasing or pickiug curled.....P. Woll, Jr
Hammer, Pneumatic.....M. Maximilian
Hammock.....I. E. Palmer
Harrow.....O. Bolang
Harvester, Beet-.....O. E. Duffey
Harvester, Corn-.....S. M. Houck
Harvester, Cotton-.....R. C. Scherling
Harvester cutter-bar.....I. T. Alfred
Hat-pin attachmeut.....C. J. Edlavitch
Hay-gatherer rack.....N. Fryman
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Hoist.....K. Iwahori
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Hydraulic compress...R. D. and S. J. Webb
Igniter for explosive shells, Electric.....P. Schwenke
Initial-handle.....W. F. Thompson
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Insulating-bushing.....S. M. Kintner
Insulating material.....A. B. Reynders
Insulating material.....J. C. Dow
Internal-combustion engine.....R. Lucas
Jar-top fastener.....J. J. Decker
Joint.....J. Coppersmith
Journal-box lid.....T. H. Symington
Keyboard mechanism.....J. R. Rogers
Keyhole-cover for locks.....J. Roche
Kiln.....T. M. Wilson
Knit goods and making same, Reinforced..M. T. Murphy
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Knockdown box, crate, &c..J. A. Coffey et al
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Ladder.....J. McGill
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Ladder, Sectional fruit-picking step-.....A. McComas
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Leveling and scraping machine.....M. P. Zindorf
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Life-saving machine.....T. F. Browder
Line-Casting machine.....D. S. Kennedy
Liquid-fuel-burning apparatus..F. E. Nelson
Liquid pasteurizing or cooling apparatus..M. Thomsen
Loading apparatus.....H. T. Shipley
Lock.....B. Summerfield
Locomotive, Articulated compound.....J. W. Kendrick
Locomotive ash chute and flusher.....W. J. Brown
Loom.....A. E. Rhoades
Loom picker-strap.....N. Lemaire
Loom, Weft-replenishiug....E. W. Barrett
Lozenge making, stamping, and cutting apparatus.....J. Trenor
Lubricators, Sight-feed for..F. W. Edwards
Lubricators, Sight-feed for..F. W. Edwards
Lunch-box.....C. Kukurnda
Magneto-generator, High-tension.....E. Denieport
Mail-bag catcher and deliverer.....C. H. Anthony
Mail-boxes, Coin and letter holder for rural.....A. H. Griffin et al
Mail delivering and receiving apparatus....N. J. Nelson
Match-safe.....C. M. Mohr
Matrix-dimensioning machiine.....J. S. Bancroft et al
Mausoleum.....V. Erusberger
Measuring machines, Bolt for cloth.....R. G. Nicholas
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Meats and other articles, Machine for cutting.....J. Kress
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Milking-machine, Electric vacuum.....G. B. Cramp
Mine, torpedo, and the like, Submarine....K. O. Leon
Mitt and glove.....J. Yeager et al
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Mold-handling apparatus.....T. V. Dimou
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Molder's flask.....A. Becker
Monkey-wrench.....P. C. Post
Mop head aud wringer, Combined.....L. Weiwers
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Motor-controlling apparatus, Inductive....A. Sundh
Motors, Automatic coutrolling-switch for electric.....R. L. Guiou et al
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Necktie.....F. Benson
Necktie form and retainer.....P. Leeve
Nozzle, Dredge-.....W. A. McCauley
Numbering-machine.....S. Moe
Nursery-chair.....J. W. Hencke
Nut for carriage-top props.....J. Wiuter
Nut, Jam-.....C. Burns
Nut-lock.....C. B. Johnson et al
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Nut-lock.....J. R. Perkius
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Oiling device, Valve-.....W. J. Richards
Ore-briqueting.....W. Lessing
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Ores, Lixivating.....G. Vervuert
Packing, Rod-.....E. E. Switzer
Paint composition.....N. B. Arnold
Panel construction.....H. C. Bumpus
Paper, Device for water-surfacing.....W. C. Watson
Paper-folding machines, Feeding mechanism for.....A. R. Little et al
Paring machine, Cocoanut-..F. Stamm et al
Pen or pencil elip.....W. W. Sanford
Penholder.....W. Hahn
Pen-rack.....G. H. Wagner
Percolating device.....J. W. Chapman
Piano-actions, Pianissimo device for.....W. C. Vough
Pianos, Key-frame for.....J. P. Caulfield
Pipe coupling, Train-.....J. Hough et al
Pipe-lining apparatus.....J. O. Persons
Pipe, Machine for forming continuous.....J. L. Wiggins
Pipe-threading tool.....J. B. Phillips
Pipe-wrench, Chain.....G. Amboru
Pipes, Apparatus for forming castings about.....J. Lawson
Pipes, Apparatus for making cast-iron..F. A. Field
Planter and cultivator, Irrigating.....J. D. Coplen
Plastic and elastic substances, Production of.....L. Berend
Plastic forms, Apparatus for making tapering.....G. F. Pemberton
Plastic material, Process and apparatus for forming articles of.....C. J. Kirk
Plow, Disk.....E. Fowler
Plows, Riding attachment for..W. L. Kissel
Plug, Attachment-.....F. E. Seeley
Potato-digger.....J. Reuther
Potato digger and separator....O. R. Brown
Potato-digger point.....O. R. Brown
Potato-separator.....C. O. Pallas
Printing-machine.....O. Roosen
Printing-machine bed-motion.....H. Pearce
Printing machine, Stencil-....C. S. Tanner
Printing-press.....E. B. Robinson
Pruning device.....C. H. Meyer
Pulley, Sheet-metal .....E. T. Shepard
Pump, Hydropneumatic.....F. J. Emeny
Pump, Pressure-..F. W. Humbarger et al

Pumps, Valve-rotor for..E. L. Milligan et al
Pumping mechanism.....C. C. Wickwire
Putty knife and scraper.....W. P. Lane
Puzzle.....W. H. Squire
Quad mold and actuating mechanism therefor, Low-.....F. S. Channonhouse
Rail joint, Continuons-.....H. E. Hoff.
Rail-tie.....C. Moyer
Railographs.....J. H. Milbnrn
Railway armored wood cross-tie..G. A. Case
Railway-tie.....A. Traliot
Railway-tie.....J. Whitehead
Railway-tie and fastener.....R. S. Ullrich
Railway-tie, Metal.....F. N. Brooker et al
Railway-tie, Metallic.....W. H. Shear
Railway-tie, Metallic.....W. U. and S. J. Gamble
Railway-track brake.....J. E. Atwood
Razor, Safety-.....L. Nahemow
Razor-strop.....M. A. Mihills
Reamer and auger.....W. G. Lloyd
Refrigerator.....O. O. Owens
Refrigerator, Cement or concrete.....W. H. Kuox
Regenerator.....E. Bender
Rifle.....H. Sunngard
Ring holder, Rotary-.....B. Hall
Riveter.....L. M. Amspacker
Rocket-head grapple.....J. C. Hall et al
Rotary steam-engine, Componnd.....O. O. Nygaard
Rotatable gate or door....F. O. Kullander
Rubber goods, Vulcanizing.....W. W. Duncan et al
Rudder for boats and ships....F. Muuster
Saddles or pads, Making harness..D. Krug
Safe.....V. A. Smith
Safe and vault door.....G. L. Damon
Safe locking mechanism.....G. L. Damon
Safety device.....T. W. Lingard
Saud cooling aud tempering apparatns.....D. Giles
Sand-mold flask.....J. Macphail
Sand-mold jacket.....J. Macphail
Sand or other fine particles from cotton or other material, Apparatus for removing.....F. B. Cumpston
Sash-fastener.....M. J. Fogarty
Sash hanger, Window-.....O. E. Parsons
Saw filer and setter.....H. G. Watkins
Saw-handle.....C. M. Minton
Saw-set.....A. Tilden
Sawmill set-works.....E. Johnson
Scaling or climbing device.....L. L. Allen
Screens, Adjustable frame for table-.....S. Crocker
Seal, Car-.....E. G. Gebauer
Sealing-caps to vessels, Implemeut for applying.....J. A. Hicks
Separator.....A. J. Meyer
Serving-rack.....E. Haller
Shade and curtain bracket.....C. L. Renzenbrink
Shells in shell-holders, Machine for assembling.....H. Stillwell
Shingling and clapboard gage, Combination straight-edge.....C. H. Webster
Ships' hulls and the like, Cleaner for.....W. R. Macdonald
Shoes, Resilient tread and reinforcing-spring for.....J. H. Curley
Show-case.....A. Reinle
Show-case corner-fasteuing, Glass.....C. M. Mortensen
Shutter fastener and bower..H. Zimmerman
Shuttle-changing mechanism, Automatic...S. Toyoda
Sister-hook.....H. H. Straughan
Smoke-condensing and gas or fume absorber.....P. Marron
Smoke-pipe.....C. E. Klein
Solids from liquids, Apparatus for separating.....L. C. Trent
Sound-records with electroconductive material, Apparatus for coatiug.....I. W. Norcross
Spark-arrester and smoke-consumer.....J. E. Hazelton
Spark-coil.....C. H. Thordarson
Speed device, Change-of-.....T. J. Kehoe
Spiudle-centering device.J. B. Naintean et al
Spinning-ring holder, Rotary-.....B. Hall
Splice-bar.....A. W. Stricker
Splints, Machine for assembling and screening.....L. A. Clinton
Spoke-tightening device.....R. Weidermann
Spool, Extension-.....P. J. Mealil
Spray device.....C. Revaillot
Sprinklers, Power for antomatic.....E. A. Rix
Squeezer.....R. E. Gilchrist
Stacker, Hay-.....F. Wyatt
Stalk-cutter.....T. A. Davis
Stamp, Dating-.....P. B. Hill
Stamp, Time-.....F. Purdy
Starting-gate for sports....W. H. Brenner
Steam-engine.....J. Stumpf
Steam-trap.....W. R. Templeton
Steam-trap.....G. Keisling et al
Stencil-frame.....F. D. Barnum
Stop and reverse mechanism, Automatic.....D. D. Hungerford
Strap-hanger, Passenger....W. B. McCarthy
Subfloating bodies, Automatic depth-regulating device for freely-.....K. O. Leon
Suction supporting device.....C. A. Austin
Telegraphic circuits, Apparatus for transmitting signals over.....L. M. Potts
Telephone-mouthpiece.....A. K. Young
Telephone system.....D. S. Hnlfish
Tenoning-machine.....J. Ojanguren
Testing set.....C. A. Hoxie
Thread-gnide.....I. E. Palmer
Thresher-concave.....M. Flynn
Threshing-machine.....A. W. Cameron
Threshing-machine feeder.....F. Hamachek
Ticket folding and cutting machine.....F. Marcus
Ticket receipt, Railway-.....W. H. Barnes
Tie-plate washer.....J. W. Kendrick
Tile-mold....O. P. and R. L. Raber et al
Time-recorder for homing-pigeons.....G. M. Mills
Tire armor, Vehicle-.....C. S. Barrell
Tire, Pneumatic.....L. B. Krum
Tire, Vehicle-.....W. W. Scott
Toilet-comb.....F. E. Youngs
Tool, Combination-.....J. I. Shaw et al
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Tool, Hand-.....A. G. Lamb
Tool-holder.....F. Shapowalow
Top.....S. H. Law Sr
Torpedo and the like.....K. O. Leon
Track-cleauer.....E. B. Lockrem
Track-drill.....E. Pierce
Track-fastener.....C. H. Tibbetts
Tree-holder.....H. J. Wagner
Triangle, Registering-.....J. Meacham
Trowel.....W. W. Wolary et at
Truck, Manure-.....G. A. aud C. J. Pieper
Truss, Hernial.....B. F. Lockwood
Turbine.....R. H. Goldsborongh
Turbine blade and vane....H. S. Loud et al
Turbine, Elastic-fluid.....R. N. Ehrhart
Turbine engine, Steam-.....E. F. Edgar
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Type-bar and typographic form.....F. H. Richards
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Type-molds, Forming, attaching, and positioning nick-pins in..J. S. Bancroft et al
Type-writer.....J. L. McClintock
Type-writing machine..H. W. Merritt et al
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Umbrella.....E. F. Brunello
Umbrella.....F. D. Philp
Valve.....H. M. Hillegass
Valve.....J. G. Talmage
Valve.....N. H. Suren
Valve or cock.....P. J. Connors et al
Valve or gate for weirs or the like.....H. Buehler
Valve, Throttle-.....E. P. Caldwell
Valve, Throttle-.....J. S. Chambers
Vapor-burners, Feeding device for.....L. O. T. Thompson
Vaporizer.....G. F. Swain
Vegetable-cutter.....A. E. McGrew
Vehicle starting device, Motor..A. E. Garnier
Vehicle-wheel, Resilient.....J. Norgren
Vending-machine.....B. Lovatt
Vending-machine coin-controlled mechanism.....B. Lovatt
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Ventilator.....A. Brynteson
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Vise, Combination-.....J. Crawford
Voting-machine.....J. McTammany
Wagon.....H. Peterson
Wagon-bed and hay-rack....J. L. McIntire
Wagon-bolster, washer.....J. Y. Martin
Warm-air furnace.....C. E. Stewart
Washing-machiue.....F. W. Kranz
Washing-machines, Clothes-pounder for....W. L. Roberts
Watch.....C. H. Meylan
Water-closet bowl.....J. F. Kelly
Water-closet spring attachment.....J. W. Spalding
Water-gage.....J. Torok
Water-glass, Automatic-shut-off.....C. F. Moore
Water-heater.....H. S. Humphrey
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Water-motor.....C. A. Whelan
Water, Purifying.....J. Roche et al
Water-wheel.....R. W. Masterson
Weeder.....C. F. Billau
Weighing apparatus, Automatic.....A. Sonander
Well-sinking apparatus.....J. T. Rea
Wheelwright-machine.....A. A. Merrill
Wick blue-flame burner....A. J. Blackford
Winding-machiue.....L. H. Ballou
Windmill-drive.....R. B. Cummiins
Window.....P. J. A. Smith
Wire-coiling apparatus.....C. L. Ritter
Wood, Creosoting.....P. F. Dundon
Wood-preserving apparatus...P. F. Dundon
Woodworking-machine attachment.....A. C. Tippett
Wrench.....M. A. Shoop
Yarn or thread, Producing....I. E. Palmer

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Bracelet or similar article.....J. Finburg
Chair.....W. A. Voncanon
Inkstand.....C. H. Numan
Lamp casing, Gas-.....J. Lederer
Paper-weight.....C. F. Saucreisen
Piano fall-board.....C. L. Peters
Tire, Automobile.....I. B. Kempshail
Trimming.....D. F. Weyl
Vase.....D. H. Moore.

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Air-brake coupling.....M. A. Brown
Alloy.....J. T. H. Dempster
Ammonia-condenser and liqnid-cooler.....A. H. Baer
Amusement apparatus.....D. H. Cleghorn
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Bait receptacle, Live-....H. M. Montgomery
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Barrel-hoop.....R. McGaffey
Battery-holder system.....G. L. Patterson
Battery plate, Storage-.....F. M. Holmes
Bearing, Gnide-.....E. W. Mix
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Binder, Bill-book and record.O. C. Mantenfel
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Boats, Means for expelling the gas-engine exhanst of submarine.....L. Noe
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Brake-beam finger-guard.....C. E. Bauer
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Broom-cover-making machine....F. Kenoyer
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Button-clasp.....M. F. Burns
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Car, Railway-.....J. O. Neikirk
Car, Railway-.....S. Otis
Car-replacer.....G. W. McMun
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Cellulose formate.....S. V. Kapff
Cement block and wall mold..C. A. Torrance
Cement-block machine.....W. G. Korab
Cement, Making hydraulic....J. M. Carrere
Chain, Drive-.....W. J. Belcher
Chain, Drive-.....F. L. Morse
Chain, Sprocket-.....F. L. Morse
Chain, Sprocket-.....F. L. Morse
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Chair-seats, Manufacture of..E. P. Wanner
Chalk-holder.....J. W. Puterbangh
Chilling and preserving chamber.....M. Mederer
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Cigar mouthpiece and lip-protector.....O. Hammerstein
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Cigarette-box.....C. Campus
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Cluster-socket.....J. C. Tournier
Clutch.....W. H. Boutell
Clutch-bolt.....L. F. Schmidt
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Coat-holder.....A. C. Brovald
Coating composition, Liqnid.....P. Jaeger
Coating-machine.....W. A. Zickerman
Cock, Stop-.....G. T. Stark
Coffee-beans, Extracting caffein from whole.....H. Trillich
Coffee, Extracting caffein from..H. Trillich
Coffee-mill.....F. Bartz
Coffee-mill.....F. Bartz
Coffee, Treating.....L. Seisser
Coin-freed prepayment mechanism.....W. Hamilton
Coiu-tester.....W. F. Trippensee
Collar-fastener and tie-support, Combined..W. O. Pierce
Collar fastener, Horse-.....A. J. Dains
Column for wharves, piers, &c., Supporting-.....S. G. Hindes
Comb.....H. C. Heffner et al
Combination-lock.....D. Dorman
Combination-lock.....A. and S. Leszczynsky
Combustion recorder or indicator.....S. D. Merton
Commutator-motor, Single-phase.....E. F. W. Alexanderson
Compass and divider.....C. S. Evans
Compass, Beam-.....P. S. Heller et al
Compressed-air engine.....C. B. Hodges
Computing device.....I. L. Davenport
Computing or adding machine...F. F. Main
Conceals, Machiue for filling..R. E. Smith
Coucrete beam, Reinforced-....G. Dujardin
Concrete construction, Reinforced.....S. Burrowes
Concrete floor construction, Reinforced-...J. M. Jones
Concrete-wall mold.....H. J. Kimmel
Coudenser.....M. Leblanc
Condenser, Jet-.....M. Leblanc
Convertible chair.....C. F. Miller
Conveyers, Stop for.....C. T. Adcox et al
Copy-holder.....N. K. Bowman
Corer, Apple-.....B. H. Cressman
Corner-bead for plastering or concrete reinforcing.....E. W. Norton
Cotton-chopper.....R. M. Garner
Cotton-grabot cleaner.....J. T. Rodgers
Couch or framed hammock....I. E. Palmer
Coupling.....W. F. Baum
Cover-clamp.....S. E. Lofland
Crate, Folding shipping-.....R. L. Bayne
Crate lid, Egg-.....H. H. Boenker
Crew-saving and submarine salvaging device.....A. W. Reed
Cue-guard.....P. L. Fnrey
Current motor, Alternating-..H. Alexander
Cut-out.....J. L. Smith
Cutting-wheel.....W. W. Tainter et al
Cycles and other vehicles, Brake for motor-driven.....H. and A. Dufanx
Dental hot-air appliance.....W. Lamb
Dental-spray attachment for handpieces..A. F. Dollin et al
Die-stock, Adjustable.....J. B. Phillips
Displacement structure.....L. H. Nash
Display-rack.....A. S. Hughes
Display-stand (reissue).....G. R. Ford
Distillation.....H. O. V. Bergstrom
Door-check.....H. W. Daggs
Door-holder.....A. G. Hanson
Door-stop.....G. E. Honser
Draft-rigging, Friction spring.....J. F. O'Connor
Draw-cut shears.....D. C. Wheeler
Draw-off fitting, Automatic venting aud sealing.....J. L. Fate
Drawing-off rolls.....J. R. Milson
Drier.....F. R. Wilson, Jr
Drilling-machine.....G. McKnight
Drive-wheel.....G. T. Strite
Dye, Azo.....M. Herzberg
Dye, Brown azo.....M. Herzberg et al
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Elastic wheel.....G. Friedberg
Electric apparatus, Vapor.....J. T. H. Dempster
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Electric machinery, Cooling of inclosed dynamo-.....P. Amsler
Electric motor.....H. Muller
Electric switch.....F. E. Case
Electrical contact.....W. F. Taylor
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Electrodes, Treating.....L. H. Flanders
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Elevator safety device.....S. S. Lozaw
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Emery-wheel-dressing tool....C. H. Stephan
Engine attachment, Internal-combustion-..N. H. Heft
Engine igniting system, Internal-combnstion.....J. H. Friedenwald
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Engines, Operating componnd compressed-air.....C. B. Hodges
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Excavator-bucket (toggle mechanism).....C. H. Brainard
Fabrics, Machine for making ornamental impressions on piled.....A. Schnellen
Fan attachment for swings..J. Hajdn et al
Fan, combination desk and wall.....C. R. Meston et al
Fastening device.....M. O'Donovan
Fancet.....J. L. Thnrston
Faucet, Push-.....G. R. Long
Feed-bag.....C. H. Henckler
Fence machine, Wire-.....D. A. Clawson
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Filing case, Stationery.....H. S. Bane
Film-drying apparatus.....G. E. Hoglnnd
Film, Gelatin.....O. Moh
Filter and purifier, Feed-water.....W. G. Copeland
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Firearm, Repeating.....E. E. Redfield
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Fixed point or center on plane surfaces, Device for temporarily maintaining a.....J. W. Braid
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Fluid-pressure governor.....G. Macloskie
Fluid-pressure regulator.....W. V. Tnrner
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Folding box.....F. G. Fischer
Foot-mat.....J. O'Connell
Foot-power mechanism.....T. C. Prouty
Fruit and vegetable stand and rotary or turbine sprayer.....E. Gardner
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Furnace-grate and fire-bar.....R. Campbell
Furnaces and converters, Apparatus for extracting moisture from air for blast-.....J. Gayley
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Gas-analysis apparatus.....S. D. Merton
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Ice-cutting machine.....K. H. Ladegard
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Match.....H. A. Christy
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Tire outer cover, Pneumatic-....H. Staub
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Tobacco-conditioning machine.C. R. Mahone
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Amusement apparatus with undulating floor.....T. Van Kannel
Amusement device.....W. H. Stubbings, Jr
Animal-trap.....L. D. Pearsall

Arch, Sectional....W. Gossett
Ash-pan....H. A. Hoke
Automobile lamps and number-plates, Support for....H. J. Gernet
Automobile-starter....C. H. Wolcott
Automobile steering-gear....G. Laning
Automobile-wheel....T. J. Sparks
Automobile wind-shield....G. Huillier
Awning-lift....J. W. Manard
Baby-comforter....W. F. Ware
Bag handle attachment, Knit-..E. Kraemer
Baking apparatus, Bean-....F. A. Calley
Balancing-machine....N. C. Bassett
Baling-press....H. L. Whitmau
Balloon....J. Schilling
Bath mixer, Shower-....W. Ingham
Battery-cell, Insulated....V. G. Apple
Battery-holder....C. T. Mason
Bearing, Roller-....P. Massman
Bed, Convertible....M. D. Gavan
Bed, Folding....G. F. Sisbower
Bed, Invalid-....M. D. Gavan
Bed-pan....A. O. Jacksou
Belt-clasp....C. E. Smith
Belt for military or sporting use....H. H. Savage
Belt-strap, Detachable....C. E. Winquest
Belt-tightener....M. Meiers
Binder, Loose-leaf....A. Trini
Binocular periscope....C. H. Bedell
Bit-holder, Extension....W. A. Peck
Boats while in operatiou, Maintaining equality of weight in submarine....P. Winand
Bolt-cleaner....J. K. Witzel
Book, Manitolding-....P. Auscher
Book- Renewal check-....H. F. Johnson
Bottle-closing device....C. F. Jenkins
Bottle closure, Wide-mouthed-..R. Zastrow
Bottle, Non-refillable....R. Williams
Bottle, Non-refillable....B. E. Paul
Bottle, Non-refillable....L. Anderson
Bottles or like vessels, Closure for....P. Leinbrock
Box or package....J. N. Hahn et al
Brake....J. D. Wenier
Brake-beam....C. F. Huntoon
Brake-beam....C. H. Williams, Jr
Brake-beam....P. B. Harrison
Bran digestible, Rendering....D. Finkler
Bread, meat, and the like, Cutting device for....M. Korallis
Brooms, brushes, &c., Dust-blowing, attachment for....F. C. Davis
Brush and mop attachment, Combination..L. F. Schmid
Brush, Feather....E. E. Smith
Brush, Fountain....L. R. Reed
Bucket, Stock feed-....J. F. Alexander
Buckle....I. T. Thorne
Buckle....E. N. Humphrey
Burglar-alarm, Car-door....G. A. Ulrich
Burner....O. C. Musser
Burner....J. M. Green
Butter box or receptacle, Creamery-....R. F. Stewart
Cable-hanger....R. W. Hubbard
Cake-icing machine....R. V. Sucher
Can-heading machine....F. Wegner
Can-opener....J. P. Keeley
Can-opener....J. L. Shrode
Can-stripper....J. E. Baster
Can protector shield....F. P. Lasio
Capping-machine....F. Mueller et al
Car coupling, Mine-....J. S. Paxton
Car-door....F. A. McComber
Car, Dump....R. L. Sites
Car-fender....J. W. Weaver
Car-fender....J. J. Kelly
Car, Railway-....R. J. Edwards
Car, Railway-....J. Bryan
Car-replacer....W. H. Bussabarger
Car-roof....W. K. Lavis
Car-sash, Metallic....E. E. Greene
Car-underframe....C. E. Frede
Cars, Equalizing truck-mounting for electric traction-....P. N. Jones
Carbureter and controller for internal-combustion engines....J. L. Tate
Carpet-stretcher....E. P. Wegner
Carriers, Elevated track for....J. C. Fitzgerald
Cartridge....G. E. Loeble
Cash-register....R. Treber
Casket-top fastening....G. C. Frazier
Cattle-guard....T. Moriarty
Cement-mixer....A. Heinberg
Cement shingle....O. O. Burnett
Certificate, ticket-holder, and receipt therefor, Combined stop-over..C. W. Alexander
Chain ends, Lock for connecting..W. Adler
Chain-grate furnace....E. Bousse
Chair....E. Urba
Check-holder....P. J. Harrigan
Cheese cutter, Brick-....A. C. Seibel
Chimney-lining....F. B. Wilkinson
Churn and butter-worker, Combined....L. A. Disbrow
Churn and butter-worker, Combined....M. Deeg
Cigar-holder....E. E. Taliaferro
Cigar pointing and finishing device....R. E. Fowler et al
Cigar-wrapper cutter....R. Borgfeldt
Cleaning apparatus, Relief device for....A. G. Gekeler
Cleaver, Butcher's....W. S. Ward
Cloth-cutting machine....J. A. Firsching
Clutch, Automatic safety-stop..C. F. Heinss
Clutch, Friction-....J. E. Werner
Clutch mechanism....F. P. Murphey
Coal and the like, Means for piling....W. H. Yost
Coaster-brake, Back-pedaling....C. E. Forsyth et al
Coat-sleeve....J. Leiner
Cock and valve....H. Yuill et al
Coke in coke-ovens, Apparatus for watering....W. L. Affelder et al
Comb....L. B. Zumbrook
Commutator construction....F. E. Hirt
Concrete-block-making machine....J. A. Adams et al
Concrete construction, System of centering for reinforced....H. Brussel
Concrete-mixing machine...C. F. Lancaster
Concrete, Reinforced....R. McLaughlin
Concrete structures, Means for erecting....J. Taylor
Concrete walls and the like, Machine for molding....A. J. Stoeser
Conveyers, Grip for tramway bucket....B. C. Riblet
Conveying device for strips of material, Roller....O. Oehring
Corn, Machine for cutting green....J. A. Gerry
Corset....A. Benjamin
Cotton-chopper....E. E. Thomas
Cotton-gathering machine..W. W. Edge et al
Cradle....J. Cliff
Cradle....F. Brown
Crate, Folding....A. C. Michael
Cravats and the like, Fastener for....J. Seifert
Culvert....A. McIntyre
Curb-joiut....N. Dubuc, Jr
Current-motor....J. H. Atkins
Curtain-guide....L. E. Hyues
Curtain-pole....F. J. Coleman
Curtain-pole bracket....C. F. Lann
Curtains and the like, Device for suspending....E. Andreae
Cuspidor....J. Meyerhoft
Cuspidor-cleaner....O. O. Ritzlaff
Damper apparatus, Time....G. R. Youug
Dandelion-destroyer....L. C. McAllister
Diaphragm....C. Zarr
Disappearing chair....W. H. Stow
Display apparatus....C. Orgaard
Display-counter....C. W. Kress
Display leaf-turner, Book-....J. R. Elliott
Display stand, Hat-....D. J. Heagany
Distillation of heavy and residual oils of petroleum....V. Huglo
Ditching-machines, Traction-apron for....C. S. Brown
Doll, Dancing....A. M. Preston
Door....J. H. Van Zandt
Door and damper operator....J. Laus, Jr
Door fastener, Sliding....W. H. Durant
Door fastener, Sliding....W. H. Fry
Door, Grain-....H. Thompson
Door-lock....F. Solywoda
Door-securer....F. T. Robinson
Door- Sliding....R. W. Schweimler
Draft-equalizer....J. B. Pollon
Draft-gear....A. L. Stanford
Draft-gear....O. Anderson
Draft-gear....C. S. Corning
Draft-regulator....D. M. Kimmel
Drawing-table....J. P. Skripee
Dry meter....S. Simpson
Drying or condensing apparatus..M. Topfer
Drill....J. P. Tye
Driving mechanism, Automatic..E. S. Ensign
Dust-pan....O. P. Olson
Earthenware, Skeleton structure for the production of....E. L. Jester
Egg-testing device....C. Woodring
Elastic wheel....C. F. Renard
Electric apparatus, Vapor....C. O. Bastian et al
Electric cut-out....P. T. McNally
Electric elevator, Alternating-current....D. Larson
Electric motor, generator, and other apparatus....R. D. Mershon
Electrical-conductor connector..J. C. Vogel
Elevator attachment to indicate alinement of floors....B. Brodowski
End-gate securing device, Wagon-..L. Hillan
End-gate, Wagon....A. W. Bowen
Engine....F. L. Gregory
Engine-stop....C. Dewees
Engines, Electric igniter or breaker for gas-....A. F. Clarke
Engines, Safety device for cranking explosive-....C. W. Hillenbrand
Engraved plates, Mount or block for....J. P. Sutherland
Envelop and advertising device, Theater-ticket....J. G. Patton
Excavator-bucket....O. J. Martinson
Explosion and steam motor, combined....W. Teherepanoff
Explosive caps, Device for crimping....J. M. Jackson
Explosive-engine....E. E. Slick
Fabric-cutting machine....A. Roos
Fan, Air-cooling....N. M. Ingle
Farm-gate....J. P. Imig
Faucet for soda-fountains....W. M. Megget
Feed regulator, Boiler....H. E. Gade et al
Feed-water heater....A. A. Amstutz
Fencing, Machine for making wire....W. P. Randall
Fifth-wheel, Vehicle....M. M. Sherwood
File, Bookkeeping-....C. E. Leer
File-cabinet....W. J. Ball
Fire-alarm, Thermo-electric....G. Blackhall
Fire-extinguisher....T. F. Handly
Fire-extinguisher....G. C. Magill
Fire-extinguisher....T. F. Handly
Fire-extinguisher....T. F. Handly
Fire-protector for oil-tanks, Automatic....W. J. Donnell
Firearm....H. M. Kolb
Firearm-sight....E. R. Tufts
Firearms, Cartridge-stop for magazine-....J. D. Pedersen
Firearms, Firing-pin for hammers for....H. M. Kolb
Fish-flesh, Treating....K. Schwickerath
Fish-hook....J. R. Sjolander
Fisherman's needle....W. J. May
Fishing rods, Means for clamping reels on....F. F. Becraft
Flashboard....H. L. Coburn
Flexible coupling....D. E. Maxfield
Fluid-elevator....R. L. Eberman
Fluid-pressure regulator....A. G. Beckman
Fly-catcher, Portable....C. H. Pearce et al
Fly-exit....L. W. Clark
Flying-machine....E. J. Augsberger
Folding box....J. M. Puley
Folding chair....W. H. Stow
Folding-machine....S. G. Goss
Folding-machine....S. G. Goss
Folding-machine....H. C. Schroeder
Folding mechanism....H. C. Schroeder
Flushing tank or cistern..G. W. Palmer et al
Food-chopper....O. D. Woodruff
Forging and cutting machine....J. Delzer
Funnel....R. L. Best
Funnel, Measuring-....J. B. Romero
Furnace for heating metal bars..W. J. Mack
Furnace-regulator....O. F. Lawrenee
Fusees, Compound for railway-signal....I. Niditch
Game apparatus....R. H. Zsehau
Game device....E. L. Ellis
Garment....R. P. Prendergast
Garment-rack....G. M. Vail
Garment-supporter....W. P. Kellogg
Gas feeding and mixing device..F. E. Dillon
Gas-generator....G. A. Heckert
Gas generator, Acetylene-....G. E. Johnson
Gas ignition and control, Automatic....L. G. Bartlett
Gas-meter, Dry....T. B. Wylie
Gate-operating mechanism, Tilting-....F. A. Guth
Gear-casing....E. R. Mason
Gear-casing....R. A. Palmer
Gearing....A. F. Clarke
Gearing, Reversible transmission-....W. M. Kouns
Gearing, Reversing-....F. E. Paine, Jr
Gearing, Trausmission-....W. Folberth
Gearing, Transmission-..W. W. Henderson
Glass-drawing mechauism, Sheet-..J. Player
Golf-ball trap for golf putting practice....C. W. Johnson
Governor for explosive-engines, Automatic fuel-cut-off....J. I. Wood
Grader, Road-....A. Ganser
Grain-drier....L. C. Kiser
Grain-drill....J. F. Steward
Granary, Portable....W. J. Haas
Grinder, Feed-....J. E. Lappen
Grinding-machine....C. W. Renear
Gripper....E. A. Stiggins
Gun-muffler....G. F. Childress
Hammer, Power-....F. E. Sutherland
Hand or tool-holding attachment for amputated arms, Artificial..D. W. Dorrance
Harrow, drag, and pulverizer..W. B. Mitchell
Harrowing of the ground, Mechanism to lift the drags during the....W. von Tecklenburg
Harvester....B. Holt
Harvesting-machine cutter....J. H. Wilsou
Hat-fastener....R. Daboul
Hat-pins, &c., Safety attachment for....G. Hofman
Heald-shaft for wire and metal healds....H. B. Barlow
Hides, skins, or leather, Machine for treating....W. A. Wust
Hoist, Fluid-actuated balanced....G. F. Steedman
Hoisting apparatus, Multiple....A. M. Coyle
Hoisting-bucket, Bottom-dumping....A. M. Doud
Hopple....G. Chambers
Horseshoes, Apparatus for mauufacturing..C. E. Pedersen
Hose-coupling....F. G. Schaefer
Humidor....L. Kahn
Hydrocarbon-burner....S. L. Davis
Hydrocarbon-furnace....A. O. Bradford
Ice-cream-cone dipper....A. J. Daniel
Ice-cream freezer....G. W. Poillon
Ignition apparatus....E. Eisemann
Ignition trouble-finder....F. T. Cable
Index or directory....D. T. O'Sullivan
Indicator....H. A. Raedeker
Indicator....E. Pearson
Induction-motor....R. B. Williamson
Ingots and other castings, Apparatus for making metal....R. A. Hadfield
Inkstand....C. C. Miles
Insulator....A. J. Siler
Insulator-protecting apparatus....L. C. Nicholson
Internal-combustion engine...E. C. Richard
Invalid raising and moving device....C. W. Lane
Ironing-board....T. A. Davis
Ironing-board....F. V. Shampine
Irrigation system....P. W. Sweeney et al
Keg-rinser....A. C. La Budde
Key-extracting device....A. T. Rowe
Kiln....E. Anderson
Knitting-machine needle....J. C. Egly
Labeling machine, Can-end-....L. W. Earl
Lamp, Electric-arc....J. Rignon
Lamp, Gas....F. J. Humphrey
Lamp, Gas....F. J. Humphrey
Lamp, Gasolene-....A. B. Lee
Lamp-shade....A. H. Hoag
Lamp socket, Incandescent-electric-....J. K. Lux
Lamp, Vapor-....M. Galvao
Lamps, Lock-guard for incandescent-....H. Hubbell
Lamps, Vaporizing and igniting means for hydrocarbon-....Y. Kawasaki
Land-roller....E. S. Wilder
Lantern, Reflecting-....N. H. Brown
Lasting-machine....L. B. Stamm
Latch-Door-....W. A. Mooney
Latch-Gate-....L. Congrove
Launching apparatus....C. Hunt
Lawn-trimmer....A. C. Warner
Leather-finishing machine, Variable-speed rolls....W. R. Smith
Lens attachment....F. U. Williams
Letter-case label for postal cars....H. C. Heffner
Level, Spirit-....C. Bodmer et al
Line-casting machine....G. D. Hartley
Line-check....W. W. Fowler
Linotype-machine....J. R. Rogers
Loading apparatus....J. Nichols
Loading device, Vehicle-....R. C. Miner
Lock....H. V. P. Cooke
Lock....F. B. Walts
Lock movements, Spring-box for time-....C. A. Miller
Locomotive ash-pan....J. R. Ennis et al
Locomotives, Sand-distributor for....H. R. Wasem
Loom, Needle-....C. Vorwerk
Loom shedding mechanism..A. A. Gordon, Jr
Loom shuttle-changing mechanism....O. Cosserat
Loom take-up mechanism...B. F. McGuiness
Looms, Cloth-guiding means for....E. G. Gustafson et al
Lumber and veneer drier, Thin-....J. A. McDougall
Mail-box....A. F. Martel
Mail-hook....J. Hammond
....H. T. Quandahl
Measuring instrument....Z. B. Tucker
Measuring loads, Apparatus for....
Mattress....F. J. Hecht
Manure-spreader....E. E. Rowley
Manhole cover, Sewer-....M. C. Rice et al
Measuring device, Ribbon and cloth....
Massage apparatus....R. H. Gay
Manifolding deviee....G. F. Hutchings
Manufacturing instrument....G. W. Moore
....E. De Lorenzi
Meat-boning implement....H. Gellman
Mechanical movement....R. Lindner
Merry-go-round....J. D. Walsh
Metal band....J. A. Gray
Metallic tie and rail fastener....W. H. Chamberlain
Milk-can....E. M. Kimball
Milking-vessel support....S. W. Gerster
Milling-machine attachment..J. R. French
Mining-drill....G. W. Nixon
Mining-drill....G. W. Nixon
Mold....W. M. Sheppard
Mold....P. H. Allison
Mold for collapsible metal centerings....S. L. Sheets
Moldiug-machine....R. S. Bueh
Mosquito-net frame....E. L. Moffitt
Mowers, Grass-elevator for horse lawn-....T. Spencer
Mowing-machine....M. G. Otis
Mowing-machine cutter-bar..J. H. Poole et al
Muffler....H. J. Cordle
Music-rack....J. Sweeney
Music-turner, Automatic..M. L. W. Wilson
Neckwear....F. K. Blanchard
Nest, Hen's....S. M. Hixson
Numbering-machine....B. B. Conrad
Nut, Frictional lock-....W. F. Kenney
Nut, Lock-....P. A. Alt
Oil-cup....J. P. Doyle
Oil-tank, Safety....W. Weston et al
Ore concentrating and separating apparatus....F. Dallemagne
Ore concentratiou, Apparatus for....T. J. Hoover
Ore-crushing machinery..E. T. Hutchinson
Ore-separatiug apparatus, Magnetic....Q. Bent
Ore-separation, Magnetic....Q. Bent
Ores, Treating arsenid....F. P. Dewey
Ores, Treating arsenid....F. P. Dewey
Orthopedic device....L. Roth
Oven, Baker's....J. C. Ferger
Packing, Metallic....W. H. Law
Packing, Metallic....E. Passono
Packing-ring, Piston....J. J. Redner
Pail, Milking-....F. H. Newlove
Paper-coating machine....E. Williams
Paper into strips and printing scales thereon, Apparatus for cutting....E. Eigner
Paper-making machines, Couch-roll for....C. H. Smith
Paper receptacle....C. F. Jenkins
Paper receptaele....C. F. Jenkins
Paper-trimmer....R. Pieree et al
Paper tubes, Apparatus for seeuring closures in....C. F. Jenkins
Paring machines, Apple-....W. R. Phillips
Pedal-action....L. W. Norcross
Peeler....R. Powell
Pen....H. W. Kueffner
Pencil-sharpener....F. E. Hiner
Photographic-priuting apparatus....W. C. Huebner
Photographic-printing apparatus....W. C. Huebner
Photographic-printing apparatus....W. C. Huebner
Photometer, Candle-foot....W. D. Ryan
Piano-action....H. O. Clark
Piano aetion, Grand....E. Schnabel
Piano-agraffe....R. M. Hutchinson
Picture-frame....B. Silfa
Pinion-cutting machine, Automatic....A. H. Neureuther
Pinion-cutting machine, Automatic....A. H. Neureuther
Pipe attachment....A. Marr
Pipe-coupling....W. R. Willetts
Pipe-coupling....J. A. Fleming
Pipe-couplings, Clamping-ring for....W. W. Price
Pipe-threading tools, Work-holder for....I. W. Nonneman
Pipes, Machine for the manufaeture of earthenware....M. Yarrow
Planer-head bits, Holding deviee for....B. D. Stevens
Planing-machines, Sectional chip-breaker for....W. R. Buss
Planing machines, Work-feeding apparatus for wood-....C. W. H. Blood
Planter and fertilizer-distributer....J. B. and C. B. Ebling
Planter-marker....L. J. Lindsay
Planter, Seed-....L. N. Todd
Plow....J. W. Stallings
Plow, Double-shovel....L. C. Gregory
Plow-frame....W. S. Hiett
Plow, Grubber-....V. O. Deyl
Plow, Grubbing-....C. D. Jauer
Plug, Detachable....C. D. Platt
Plug, Separable attachment-...C. D. Platt
Plunger-cables, Means for tightening....F. C. Furlow
Pool-table pocket....T. Maroney
Potato-digger....R. W. McKay
Potato-digger....J. M. Fallick
Potato-digger....R. W. McKay
Powder for blasting, Safety-....G. M. Peters et al
Power-shipping mechanism..W. H. Lafaelle
Power transmission....H. W. Fellows
Pressing-machine....H. Lindestrom
Printing....A. O. Watkins
Printing machine, Tapestry..G. W. Stokes
Printing-press....S. Crump
Printing-press feed mechanism..J. A. Kaeha
Printing-press paper-roll-braking meehanism....S. G. Goss
Printing-press plate-clamping meehanism....S. G. Goss

Printing-press inking mechanism.S. G. Goss
Printing-press plate-clamping mechanism... .....S. G. Goss
Printing-presses, Feeding-gage for platen... .....B. Silfa
Prints, &c., Making fast-gray.....G. Engi
Prison, Portable.....J. B. Kimbell
Propeller.....H. F. Shaw
Propeller-shafts, Means for mountiug..... .....A. Clement
Pull-sleeve, pipe or cable support or eonneetor, Combination.....J. Fountain, Jr
Pulley-dressing.....H. Leix et al
Pulp.....C. W. Roberts
Pulp and for similar purposes, Cylindermaehine for straining wood...H. Gaara
Pulp-stock separator.....G. S. Witham, Sr
Pump.....C. H. Scott
Pump, Self-measuring.....C. F. Hatmaker
Pump-stand.....J. J. Hess
Pump terminal, Suction-....C. D. Durkee
Pump, Vaeuum meiubrane-.....M. Falk
Pumps, Inlet-valve aud water-screen for... .....O. H. Lillyman
Puzzle.....R. L. Hicks
Quilling-machine attaebment..... .....W. B. Lovatt et al
Rail-cleaner.....J. P. Gorman
Rail-joint.....T. L. Humble
Rail-joint.....A. G. Broussard
Rail-joint.....F. R. Rush
Rail-joint loek.....H. L. Mason
Rail-lubrieating apparatus.A. C. Farley et al
Rail tie and fastening.....W. F. Beek
Railway-rail anehor.....D. H. Foreman
Railway system, Eleetric-....E. W. Radius
Railway-tie.....G. H. Martin
Railway-tie.....H. S. Rice
Railway-tie, Metallie.....W. J. Allbrooks
Railway-track eonstruetion....J. W. Blower
Railway-track eonstruetion..J. W. Blower
Razor, Safety-.....T. C. Durham
Reeeptaele.....J. M. Rau
Reeeptaele-elosures, Apparatus for formiug and inserting.....C. F. Jenkins
Reeeptaeles, Maehine for inserting closures in.....C. F. Jenkins
Refrigerating and ice-making apparatus.... .....W. Pfleiderer et al
Regulating device.....C. G. Sprads
Remedy for swine-plague.....A. Franke
Removable-rim wheel.....R. H. Buckingham
Repair member.....J. Heck
Retoothing-maehine.....J. P. Hedstrom
Revetment.....F. W. Hawkes
Revolving-eylinder motor, Reversible..... .....W. C. Smith
Rim, Demountable.....E. J. Bushey
Rod-elevator.....G. B. Roers
Roll-pinning maehiue.....F. P. Hoffman
Rolling-mill for tubes....A. J. McGinness
Rolling wheels, Meaus for....A. K. Audrews
Rotary engine.....S. A. Miles
Rotary engine.....N. Bindrup
Rotary gas-engine.....L. A. Laug
Running-gear.....W. E. Groover
Sand-molding machine.....W. C. Noreross
Sash-weight mold.....E. D. Leveriug
Sash, Window-.....W. P. Perkins
Saw-gage.....G. A. Lambert
Scale.....A. P. Johnstoue
Screw-driver.....A. N. Bender
Seal, Box-.....E. J. Brooks
Sealing bottles and other vessels..... .....E. P. Wetmore
Sealing-cap for bottles....E. P. Wetmore
Sealing device.....L. B. Edgar
Seat structure, Spring-.....F. O'Brieu
Seeder.....F. G. Stitehman
Seeding-machine boot.....G. F. Danielson
Separator and stacker.....E. J. Vraalstad
Sewing machine, Button-.....P. E. Schoeu
Sewing-stand.....J. Silknitter
Shade-roller.....A. Kaiserman
Sharpener for seissors, knives, aud the like..... .....J. Holt
Sharpening saw-teeth, Machine for..... .....N. J. Chambers
Shaving set.....H. J. Gaisman
Shears-gage.....J. L. Klindworth
Shears, Tension device for....G. A. Parker
Sheep-hook.....J. A. Ross
Sheet-jogging machine.....A. F. Roessle
Shelf-covering.....L. Gastram
Shifting deviee.....H. Drewell
Shingling-braeket.....F. L. Spring
Ships or vessels, Transferring device for... .....F. Roeder
Ships' riggings to chain-plates, Turnbuckle center for attaehing..C. W. Vlattenburg
Shirt.....N. H. Rankin
Shoe-fastener.....W. H. Harris
Shoe-polishing maehine..H. R. Oliver et al
Shoe tree and stretcher....C. A. Johnson
Shutter, Metallie window-.....E. W. Gray
Shutter-worker.....H. Osborne
Sign-board.....W. L. Turner
Sink-braeket.....J. P. Reynolds
Skins, hides, or the like, Machine for dressing or otherwise operating upon..... .....W. A. Wust
Skirt-supporter and blouse-retainer..... .....W. J. Taylor
Sled, Automobile-.....W. C. Niemann
Sled-runner.....J. Bystrom
Smoking-pipe, Sanitary.....A. Cibulas
Snap-hook.....W. A. Schleieher
Snow-eleaning maebine.....A. Mason
Soap-box.....J. G. Rote
Soldering-iron furnaee.....S. T. Willson
Soldering-tool.....J. E. Pettit
Spike, Expansiou key-.....H. S. Patterson
Spike-holder.....H. O. Crippen
Spinning apparatus, Traverse motion for yarn-.....A. E. Rhoades
Spinning maehinery.....C. T. Atherton
Spinning-mule.....W. D. Rundlett
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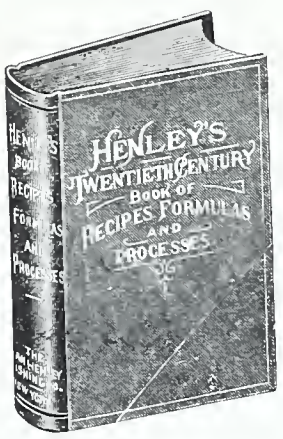

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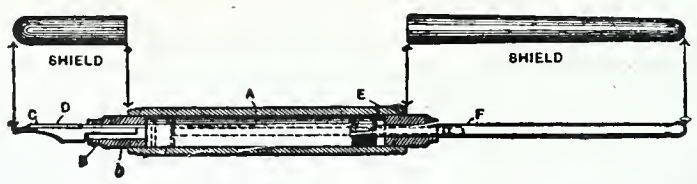

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COAL AND ORE LOADING PLANT.

By C. VAN LANGENDONCK.

ONE of the finest coal and ore loading plants now in operation in Germany, and perhaps in all Europe, is that which has recently been erected at the new Rhine harbor, Schwelgern, in the vicinity of the city of Bruckhausen. The installation comprises six swings, two double jibs and two bridge cranes, having capacities of from six to eight tons.

The six traveling swing cranes are mounted on the quay wall. Four of them have a reach of 48 feet, and the other two 51 feet. The height above the rails is 49 feet, and the distance between the track rails 16 feet. The lattice frame rests on four wheels, power being transmitted to one wheel on each side, through worm and pinion gearing from a motor above. A motor-operated band brake holds the frame stationary in any position, and prevents it from shifting under the influence of the wind. When not in use, the cranes are fixed in position by clamps acting on the rails. The counterbalanced jib is pivoted on a lattice standard, so that the top vertical strain and bottom horizontal thrust are taken up by a step bearing on the frame, the upper horizontal strain being transmitted by rollers to a throat ring attached to the frame. The lifting gear is mounted on the swing, the latter consequently turning with the driver's cab, which turns with the jib. The braces connecting the throat-bearing with the under frame are mounted so as not to obstruct the view of the driver. The journal of the step bearing is hollow, for the passage of the cable. To reduce the diameter of the lifting ropes, the load is suspended from two ropes, between which the grab rope is arranged. The lifting motor drives the two drums through intermediate pinion gearing. The grab rope is wound on a drum between the two lifting drums, a friction clutch causing this drum to turn automatically with the others, while the grab drum can be held in any position, for operating the grab, by a double band brake, which is held off by a brake motor during the raising of the load. This brake is connected with the reversing lever of the lifting switch, and is therefore operated concurrently with the latter. The swing motion is transmitted from the motor, through a horizontal worm and pinion, to a toothed crown on the frame; a brake holds the jib in any position and stops it from being blown around by the wind. The switches are mounted at the driver's stand, one of them controlling the lifting, and two being fitted with universal control mechanism, for the traveling and swing motions. The lifting capacity of these cranes is six tons.

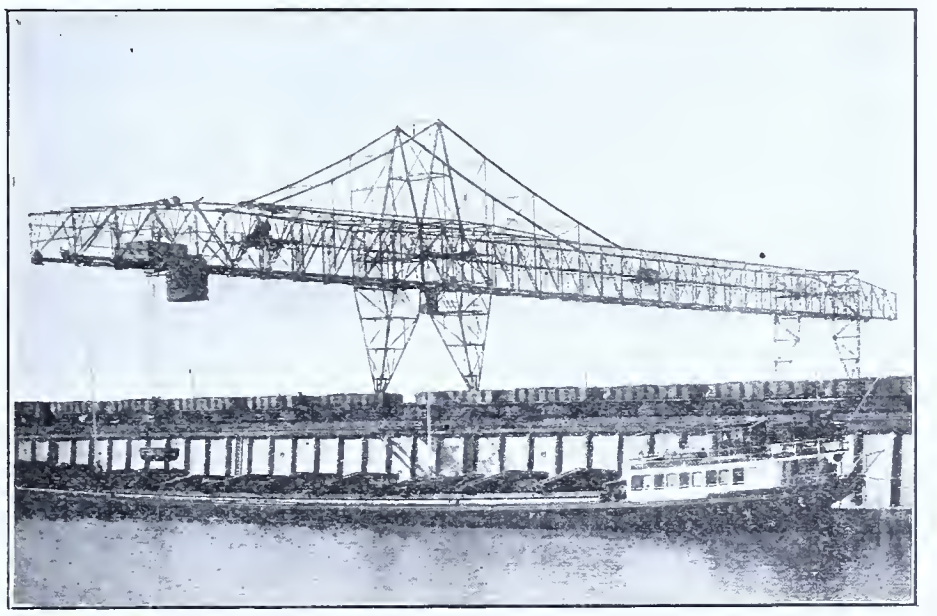


FIG. 1.—ONE OF THE TRAVELING BRIDGES.

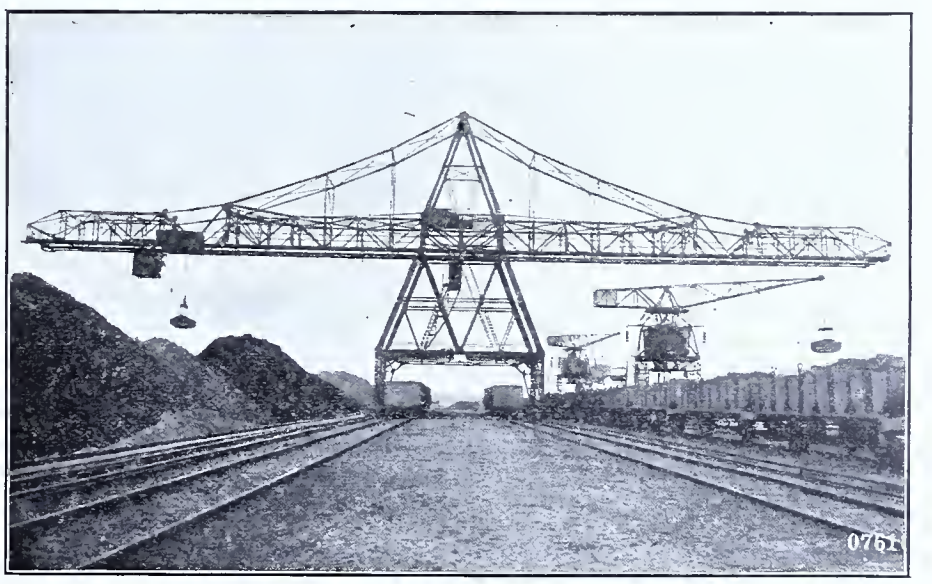


FIG. 2.—DOUBLE-JIB CRANES IN OPERATION.

The two large traveling cranes with double jibs run on parallel tracks and serve the stockyard which is covered with railway tracks and reaches up to the quay wall; they deal chiefly with material passing between ships and the stockyards, and their outer ends project over the edge of the quay; the tracks supporting the crabs, are mounted at a sufficient height to enable the swing cranes which effect the transference of goods from ship to rails, to pass underneath. In all cases the hoisting plant is fitted with hinged buckets or self-acting grabs, according to the class of goods to be handled, and it can also be equipped for dealing with piece goods, such as iron.

In the large double-jib cranes (Fig. 2) a lattice tower supports a double-sided lattice girder, carrying the rail track for the crab, which has a lifting power of eight tons. The girder projects equally on both sides of the tower. The jibs are hinged on the outer ends of the girder, and can be turned up, to enable the ships to be worked alongside the quays, and also to leave space for the two cranes to pass each other. The crab has a free passageway between the walls of the tower, and has a total traverse of 262 feet. The tower is mounted on 16 wheels, running on a double rail truck 47½ feet between centers, each track being of 40-inch gage, and the gantry spanning three sets of railway tracks. The height of this track above the rails is 49 feet. Power is transmitted to four wheels on each side of the tower from a motor in the middle of the structure, through worm gearing and pinions; and the crane can be kept stationary in any position by a motor-operated

brake. To prevent the crane from being displaced by strong winds, motor-operated clamps are provided to grip the rails, the motors for this purpose being, like all the others, controlled from the driver's stand.

The 49-foot jibs are raised and lowered by a motor situated in the tower, and operating winding drums, the ropes from which work in blocks at the rear heads of the jibs. The drums are conical in order to equalize the consumption of power during the raising and lowering of the jibs. The descent is braked by a number of plates, which are pressed together by the axial pressure of the worm shaft. Either jib can be operated by means of a coupling thrown in or out of gear. When the jibs are lowered their weight is supported by articulated fish-plates, thus relieving the strain on the ropes.

The crab carries the lifting and traveling motors, and also the driver's cab, which is slung below the girder, so that the driver always has the load in sight and a clear view over the whole traverse of the crab. The lifting gear is very similar to that on the swing cranes. The traveling motor acts on all four wheels of the crab through intermediate pinion gearing; and a brake is mounted in connection with the motor switch. When the crab reaches the end of the track, the current is shut off automatically; hydraulic buffer stops are provided at the ends. The cab is equipped with the switches controlling the crab motion and the lateral travel of the crane, while the switch for raising and lowering jibs is arranged in a cab on the platform; indicators showing the exact position of the jibs at any time, are also provided there. A stairway in the tower leads to this platform, and also to a footway extending the whole length of the crab track from which the contact rails, through which the current is supplied, can be reached.

The bridges are built of double lattice girders, the upper members of which are braced together, and carry an internal rail track for an 8-ton crab. The outer end carries a movable jib. Each bridge is supported at one end on a tower, and at the other on a simple upright lattice frame. The distance of the two supports between centers is 280 feet, the girder projecting 66 feet beyond the rear support, and 90 feet beyond the tower. The jib at the front end is 54 feet long, so that the total length of the crab track is 490 feet. The lower edge of the bridge girder is 41 feet above the railway track.

The lifting speed is 3 feet per second in the swing cranes, 2¼ feet per second in the double-jib cranes, and 3½ feet per second in the bridges. The swing cranes turn at a speed of 9¾ feet per second, and the travelers on the double-jib cranes and bridges run at a speed of 9¾ feet and 11½ feet respectively. The lateral traveler of all three classes is 40 inches per second, and the jibs take 100 seconds, in raising and lowering. The lifting motors for both kinds of cranes develop 100 horsepower, and those of the bridges 125 horsepower. The swing motor is of 15 horsepower and the crab traveling motors 30 horsepower, while the motive power required for the lateral travel is 22,45 and 112 horsepower respectively. The capacity of the three classes respectively is 6 x 120 tons, 2 x 140 tons, and 2 x 160 tons per hour.

The electric fittings are constructed for polyphase current at 500 volts and 50 periods. The current is supplied through double tripolar live rails laid in iron conduits, with a narrow slit for the passage of the shoes. For lighting, the current passes through a stepdown transformer, to reduce it to 110 volts. The cabs are heated by electricity.

NEW BOOKS.

Self-Taught Mechanical Drawing and Elementary Machine Design,

By F. L. SYLVESTER, M. E.

The demand for an elementary treatise on mechanical drawing, including the first principles of machine design, and presented in such a way as to meet, in particular, the needs of the student whose previous theoretical knowledge is limited, has caused the publication of this book. It is aimed to be adapted to the requirements of the practical mechanic and young draftsman, and to present the matter in as clear and concise a manner as possible so as to make self-study easy. Practically all the important elements of machine design have been dealt with, and besides, algebraic formulas are explained and the elements of trigonometry are treated in a manner suited to the needs of the practical man. In arranging the material, the author first devoted himself to mechanical drawing, pure and simple, because a thorough understanding of the principles of representing objects greatly facilitates further study of mechanical subjects. Attention is then paid to the mathematics necessary for the solution of the problems in machine design presented later, and to a practical introduction to theoretical mechanics and strength of materials; and finally, the various elements entering in machine design, such as gears, sprocket wheels, shafting, pulleys, couplings, etc., have been treated. This has made it possible to present a continuous course of study which is easily comprehensible and assimilated even by students of limited previous training.

Norman W. Henley Publishing Co., 132 Nassau St., New York.

Ornamental Concrete Without Molds.

By. A. A. HOUGHTON.

The process of making ornamental concrete without molds has long been held a secret. It is now given to the public for the first time in this practical treatise. It is the only work issued which explains a simple practical method whereby the concrete worker is enabled, by employing wood and metal templates of different designs, to mold or model in concrete any cornice, archivolt, column, pedestal, base, cap, urn or pier in a monolithic form—right upon the job. These may be modeled into units or blocks and then built up to suit the specifications demanded. The small contractor who cannot afford to purchase expensive molds for the many varieties of work he is called upon to do, is thus enabled to perform artistic work. The template system gives control at all times of the surface of the work, so that defects are impossible, and no more time is necessary to employ it than is required to tamp the concrete properly into a mold, with the added advantage that the worker does not have to risk breakage and spend the time to remove the work from the mold. Complete details are given of a simple machine, that anyone can build, to mold ornamental concrete more easily than it is possible with the old style models in use for this work today.

Concrete from Sand Molds.

This is another treatise by the same author and publisher, and it explains a simple system of molding ornamental and plain concrete or "cast stone" with molds of wet sand. The work that can be accomplished with sand molds is unlimited in scope. The combination of a clay pattern with an easily separable material for the mold places at the command of everyone a means for the reproduction in concrete of any work, without limit to the size, shape, or the degree of ornamentation upon its surface. The sand of the mold permits it to be broken up and removed from the center of a vase or jug, the inside of a ball, or any work where the opening is even a couple of inches in diameter. It permits the removal of cores from a design that has undercutting extending horizontally with the face of the work. The process, it is declared, will be the first in efficiency to enable the concrete worker to mold any design he may desire, without restrictions as to releasing the mold from the finished work.

Norman W. Henley Publishing Co., 132 Nassau St., New York.

Dynamo Building for Amateurs.

A practical treatise under the above heading, by Arthur J. Weed, has just appeared from the publishing house of Norman W. Henley, 132 Nassau St., New York. It describes a small machine, designed to furnish practical instruction for the electrical student, and a very large number have been constructed for that purpose. Being light, they are well adapted to class work, and are used for this purpose in some colleges. All of the machine work can be done on a small foot lathe. Dimensioned working drawings are given for each piece of machine work, and each operation is clearly described. A number of illustrations are given, showing the machine work under way, and the lathe set up with the necessary tools in position and the actual operations in progress. This feature of the book will be of great assistance to the amateur constructor. Instructions for the operations are also given clearly and concisely. The dynamo, if carefully built, can be put to practical use either in generating current or as a motor for light power, such as furnishing current for spark oils to gas engine ignition, driving sewing machines, etc.

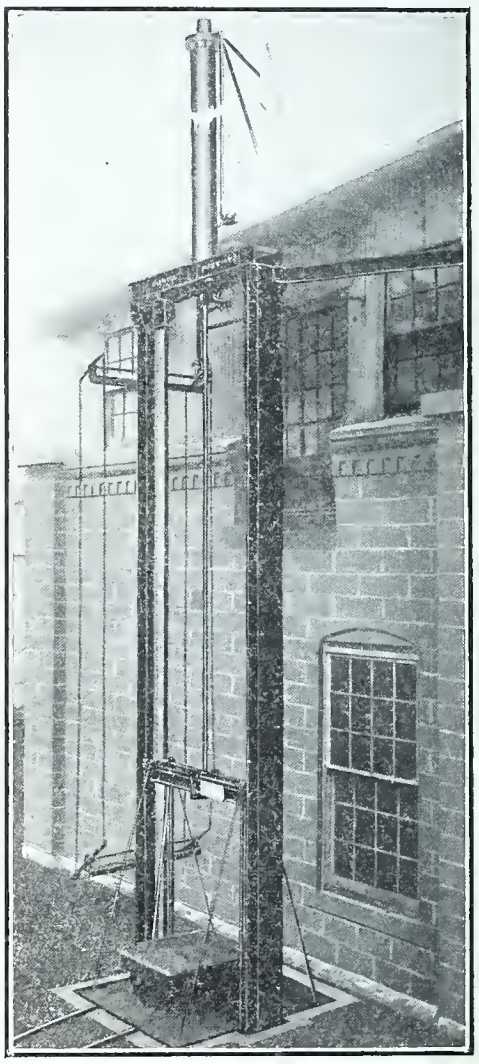
How to Get Copies of Patents.

THE INVENTIVE AGE prints each month a list of the patents granted by the Patent Office. This list includes the name of the inventor, the title of the invention and the date of the patent. Anyone can procure through THE INVENTIVE AGE a copy of any patent included in the list, by giving the data and enclosing ten cents in stamps for each copy. There is no better way of keeping yourself informed about the progress of the arts, than by scanning the list each month and ordering copies of patents.

A MODERN PNEUMATIC ELEVATOR.

Compressed air is utilized to advantage in hoisting, particularly in foundries where it is employed for other purposes such as operating sand blasts and molding machines, cleaning castings, etc. Air hoists and pneumatic jib-cranes are extensively used in foundries where pneumatic rammers are employed, and compressors are found necessary for providing the blast for furnaces.

The accompanying illustration shows a pneumatic elevator which is safe, simple and weather proof as well as fire proof. To make it fire proof, a steel frame is supplied instead of wood supports. In some instances a direct cylinder is provided over the elevator; in the rope type a pneumatic cylinder is placed by the side of the steel frame. It is often convenient to provide an elevator in the open air several hundred feet from the power house, and the pneumatic type is well



adapted for this service. No air is required for lowering, but every time the cage ascends a cylinder full of air is consumed. One interesting feature of the pneumatic elevator is that a small compressor may be provided with a very large reservoir, and this small power unit can be run constantly, the air being stored for a sudden demand. With other elevators it is necessary to provide an amount of power which shall be sufficient for the maximum demand.

The speed of lowering the empty or loaded cage and of hoisting the same is practically constant, and may be at a high or low velocity, the cage being brought to a gentle stop under all conditions by the cushions.

It may be stated that the usual speed of a freight elevator is one foot per second, and the nominal diameter of the hoist is 19 inches for a capacity

of 8000 pounds, with a pressure of 80 pounds in a rope type of construction. With direct cylinder overhead, the nominal diameter of the hoist is 17 inches for a capacity of 1,200 pounds at 80 pounds pressure, the weight of the hoisting parts being 2,500 pounds and of the cage 1,250 pounds, while the steel support weighs 3,000 pounds for a 15 foot lift. It is desirable that a factor of safety of not less than six be allowed for all ropes, and on freight elevators two ropes should be used, each of which will support the maximum load with the above factor of safety.

Ferns as Human Food.

Study of the dietary of the Japanese shows that they utilize as vegetables not only water weeds and lichens, but several species of ferns. One of the foods regularly supplied to the Mikado's troops during the late war with Russia was a kind of dried fern biscuit. Most of these edible ferns grow wild in this country, but no one ever thinks of utilizing them. There is one kind known in Japan as the warabi, which sends out roots in all directions to a distance. In spring these rootlets throw up fine sprouts, which are esteemed a delicacy. Poor Japanese obtain from the woody stems of the same plant an edible, starchy substance which they call warabiko. In Normandy, the root stocks of this species of fern are ground up and mixed with flour for bread for the sake of their bitter taste—to which, however, one must become accustomed in order to like it. The fibers of these root stocks in Japan are used for making a kind of rope which, while very strong, resists the action of water. It does not rot, as does ordinary rope when constantly wet. A species of fern that grows wild in swampy places in Japan is much valued for food, its young leaves being gathered in late spring by women and children and cooked as a vegetable. This variety is also found in the United States.

Ginning Cotton.

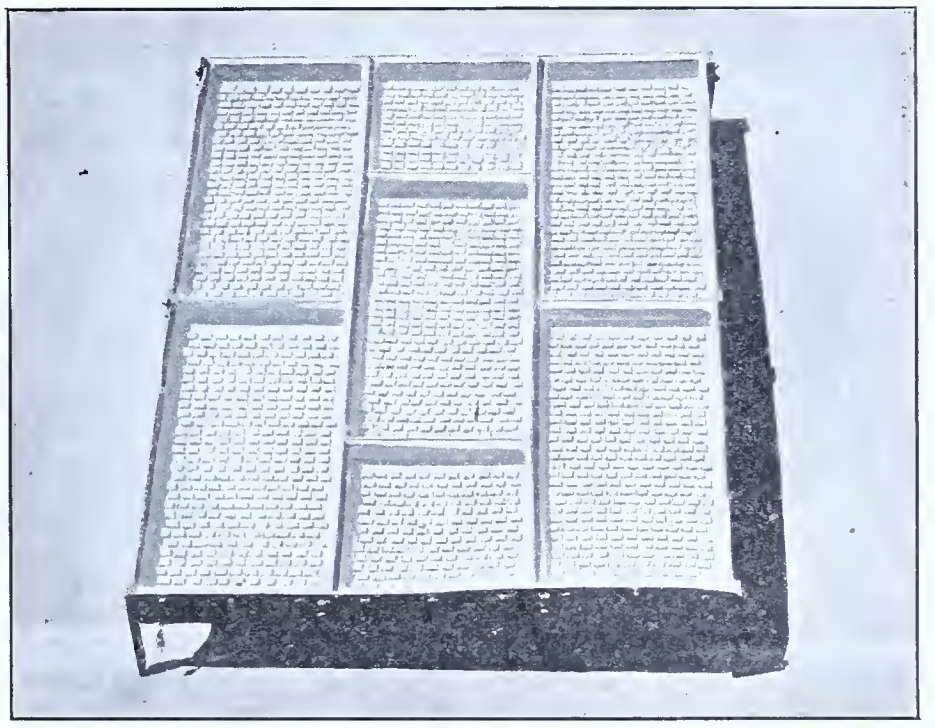
A company has been formed for the establishment of a new process of ginning cotton, which promises to accomplish such marvels for the industry. It is described as a modification of the Whitney invention. This latter was so simple and effective from the start and brought about such a saving of labor, that cotton men have continued to use it for more than a century without much change. The essential principle of the Whitney process is the running of saws between iron or steel rods at great speed, which tears the lint from the seed and separates the two with a waste of 10 to 15 per cent.

The new gin uses the saw without the stiff rods. The saws are so arranged that the seed in going over them loses a portion of its fleece from each, and the process is carried on by a succession of saws until the lint is entirely removed, practically without waste. Moreover, the fleece is removed from the seed with less damage to the fiber, and by the new method it is possible not only to produce a lint of much greater tensile strength, but to preserve the full length of the fibre, greatly reducing the number of grades. It is claimed that the Doremus process will work out great economies in the manufacture of yarns and cloth.

AN ELECTRIC GENERATOR, USING THE SUN'S RAYS.

To utilize the energy of the sun's rays for generating and storing electric current has been the dream of many inventors; but the cost of the apparatus has been prohibitive. The accompanying illustrations show a sun electric generator at Summerville, Mass., which is said to have given good results.

The inventor states that his sun generator is actuated by the action of filtered light passing through violet glass into a black absorbent, pierced by special alloy plugs, the construction of which is kept a secret.



CONSTRUCTION OF SUN GENERATOR UNIT.

The construction of the first sun generator included a light metallic framework and consisted of a sort of window with sixteen panes in it, each a foot square. Instead of ordinary window glass the panes were of a violet color. Behind each pane was installed a set of sixty-one little metallic plugs, joined electrically and passing through the framework of the generator. Each plug was embedded in a heat-resisting cement, so that the other end was always cool and sheltered from the sun when the apparatus was in operation.

The apparatus starts its work as soon as the sun's rays are allowed to shine upon it. It is maintained by the inventor that not the solar heat itself alone, but rather the invisible rays that make up part of the solar spectrum, and the ultra-violet rays themselves, by their action on the metal plugs, cause the reactions that produce a continual flow of electrical power into a storage battery.

FOUR SUN ELECTRIC GENERATOR UNITS IN SERVICE.

Ten hours exposure of this generator, it is claimed, will produce enough power to light thirty tungsten lamps for three days, and by increasing its size enough electric current can be charged in storage battery to furnish light for a week or more during stormy weather, when the sun is not shining.

Another electric generator for absorbing the sun's energy has been constructed, having five large compartments and two smaller ones, each of the former containing 308 metal plugs and the latter compartments 132 plugs each. This equipment supplies a current of six amperes at 10 volts while the sun is shining upon the same. The current is stored in accumulator cells, the battery supplying the current for lighting at night. The accompanying illustration shows a battery of four sun electric generators mounted on a roof of a building, receiving the energy from the sun's rays. Each of these four units contains 1,804 plugs of a special alloy. They generate 60 watts each supplying a current of 7 amperes at 10 volts. These frames may be connected in series or in multiple, according to whether a heavy current at low voltage is desired or a small current at high voltage.

The frame on the right in the illustration it is said can be connected so as to show 500 volts pressure per 10 square feet of surface, although the amperage is slight.

While no data is available as to the cost of the construction of this apparatus, it is held not to be excessive. The total area of the four units is 48 square feet, each frame measuring 4 x 3 feet.

Our rivers are kept smoothly flowing by the sun's power; it ripens our crops and brings the seasons in their appointed order. When you burn a pound of coal, its combustion liberates energy stored in it ages before through solar heat. The current that turns the turbines of the power stations at Niagara Falls derives its very source of energy from the alternating evaporation and precipitation of water in the far away basin of the Great Lakes. All this is brought about by solar heat alone. The power obtained from either coal or water is wasted, to a greater or less extent. Not ten per cent of the latent energy of a pound of coal is turned into actual efficient power in the steam engine. So many chemical processes must be undergone, in each of which some non-productive element enters, that at the last the efficient result is very small. Undoubtedly there is a great field for a sun electric generator which will not cost so much as to make it impracticable.

Automatic Weighers.

The discovery of the long continued frauds in the New York custom house in connection with the weighing of sugar, which have cost the United States Treasury countless millions, has led to a demand for a better system. The government is in the market for an automatic scale, to be used in the customs service. It advertises that it will pay $35,000 for twenty automatic sugar weighers, evidently preferring to trust machinery rather than fallible humanity. There are many excellent scales in use in commerce, but the automatic scale is not yet. With the marvelous development in other lines of machinery, however, it would seem that this is not unattainable.

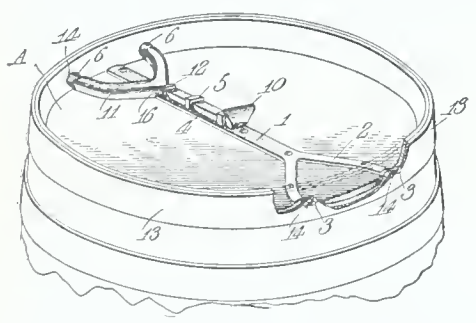
CLEVER NEW PATENTS.

Barrel Cover Fastener.—Phosphate Mill.—Teat Cup.

Barrel Cover Fastener.

When shipping goods in barrels, there is always a danger of the goods being surreptitiously removed in transit, or the head of the barrel being broken open by the weight of the contents. Albert Leclair, of Lewiston, Maine, with the idea of overcoming this objection, has devised a simple, durable and inexpensive attachment for barrel covers, whereby the cover is locked securely in place and the life of the barrel prolonged. The construction is such that the attachment may be shifted from barrel to barrel, when either the cover or the barrel itself becomes unfit for further use.

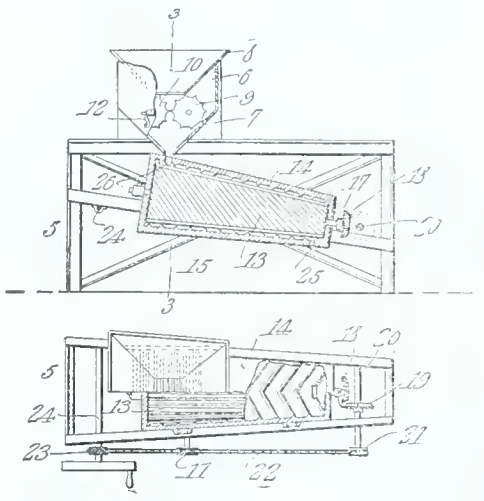
As seen from the illustration, the device consists of a bar 1, bifurcated to form a pair of arms 2 terminating in upwardly-curved lugs 3 which engage in openings 14 provided in the chine of the barrel. This bar is secured by screws or bolts to the outside of the head of the barrel, and has a pair of guides 5 in which reciprocates a bolt 4 having at one end a handle 10 and at the other a pair of arms 11, at the ends of which are the lugs 6 which pass through holes 14 in the chine of the barrel, at diametrically opposite points from lugs 3. In placing the head on the barrel, the bolt is drawn, the lugs 3 on one side are engaged in one pair of



the openings 14, and the head is swung downwardly until the lugs 6 are in position to engage the openings 14 on the opposite side, into which openings the lugs are forced, thus locking the head securely against removal. To prevent the contents of the barrel from being taken out, a sealing wire is passed through an opening in the lugs 6 and a lead seal is placed on the ends of the wire, making it impossible for the bolt to be withdrawn without removing or damaging the seal.

Phosphate Mill.

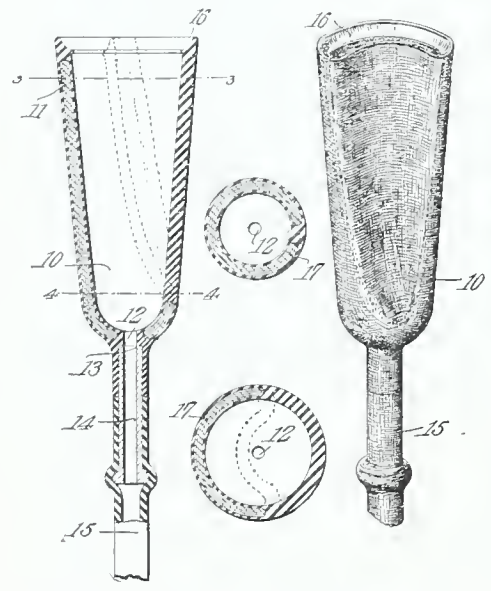
A mill designed for grinding phosphates, that has elements of novelty and efficiency, is the invention of Wm. F. Duncker, of Washington Boro, Pa. The drawings, which give a side elevation and a plan view, both partly in section, of the device, clearly illustrate its operation. The casing 6 with hopper bottom 7 is mounted in the supporting frame, and the receiving hopper 8 is located in the top of this casing. Below the discharge end of the hopper are corrugated crushing rollers 9 and 10, their points touching when the rollers are in operation, and springs being provided for pressing the rollers together. A conical corrugated grinding roller 13 is located in a casing which is divided longitudinally at its horizontal centre, the sections being shown at 14 and 15. At the free edges of the sections are outstanding flanges 16, bolted together and securing the casing to the framework. In the end walls of the casings are bearings in which the shaft 17 of the roller is journaled, this being connected by gears and sprockets to the main drive shaft 24. The grinder casing sections have two sets of interior corrugations, joined at and extending obliquely from the longitudinal centers of the sections, and running in opposite directions in straight lines to the edges, the



ribs of the respective sets diverging toward the discharge end. It will be seen that when the phosphate is thrown into the hopper, it will pass between the crushing rollers and then through the opening 26 in the casing of the roller. It is then ground between the roller and the corrugated inner wall of the casing and is discharged through the opening 25. The arrangement of the corrugations of the grinder casing, as described, causes the grinding action to be expedited, the material being rapidly reduced to the required degree of fineness.

Teat Cup.

Mechanical apparatus for milking cows is daily coming into wider use in the dairy industry, and a teat cup that approximates in operation the natural action of the calf, is in demand. A patent by Daniel Klein, of Spokane, Wash., acts to compress the teat gradually from the root toward the tip, and prevents congestion of the teat. It is formed of rubber, reinforced with non-yieldable material, and provided with a flexible section, which, when subjected to the action of a vacuum will gradually press against the teat. From the illustrations, which give perspective and sectional views of the cup, it will be seen that the latter is tapered to conform to the structure of the teat and has at its lower end



an integral nipple of rubber which communicates with the milk discharge opening at the bottom, there being an abrupt shoulder 13 formed within the nipple to receive a connecting tube 14 to which the main tube 15 is coupled, the shoulder serving to prevent the nipple tube being forced within the lower part of the cup. The flange 16 at the upper edge engages the root of the teat in much the same manner as the latter would be compressed by the gums of the calf. The upper edge and the nipple are of rubber, and the body of the cup has a reinforce of canvas, which extends at the top through about one half the circumference and at the bottom entirely around the cup, while from a point near the bottom to the top, the edge of the reinforce is inclined so as to form a tapered portion of pure rubber, with no reinforce. As the main portion of the cup is relatively stiff it will not yield when a vacuum is created in the cup by the pulsating mechanism, but the yieldable area will be forced in by atmospheric pressure, and the upper portion of the yieldable area being more flexible than the lower, will close in against the teat. As the action continues the entire yieldable area will be moved inward so that the teat will be subjected to gradual pressure from the root down. The edges of the reinforce are given an inclined form for the reason that the support is thus gradually increased from the top downward, so as to secure the desired gradual pressure on the teat.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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DEY TIME-REGISTER CO v. W. H. BUNDY RECORDING CO.

(Circuit Court, N. D. New York. March 12, 1909. 169 F. R. p. 807.)

1. PATENTS — CONSTRUCTION — LIMITATION OF CLAIMS BY SPECIFICATIONS.

Claims of a patent are to be construed in the light of the specifications, and while, when plain and specific, they cannot be extended, they may be limited thereby, and a claim is not to be defeated because it is broad in its language, when it is limited by the specifications and is susceptible of limitation.

2. PATENTS — CONSTRUCTION — MISTAKEN LIMITATION OF CLAIMS.

The remedy for a mistaken limitation in the claims of a patent is by a reissue and not by construction.

3. PATENTS — INFRINGEMENT — TIME-RECORDERS—"REGULAR RECORDS"—"IRREGULAR RECORDS."

The Dey patent No. 786,011, claims 55, 54, 60-64, inclusive, for an improvement in workmen's time-recorders, which consists generically in adding to the prior clock-controlled time-recorder, having automatically actuated time-printing mechanism, automatic time-controlled "means adapted to print regular records in a certain color and irregular records in a certain other color";—regular records being those made when a workman enters or leaves at the regular time, and irregular records those made when he enters or leaves before or after the regular time—are limited to means by which the record itself, that is, the impression of the figures or letters which record the time, is printed in different colors, and are not infringed by a machine by which all records of time are printed in the same color, but which indicates an irregular record by an extra mark printed in a different color, especially in view of the limitations imposed on the patent by the prior art, which includes means for printing extra characters.

4. PATENTS—INFRINGEMENT — IDENTITY OF RESULT.

Patents cover the means employed to effect results, and to be an infringer one must not only reach the same result, but he must reach it by the same or substantially equivalent means.

WEST PUBLISHING CO. v. EDWARD THOMPSON CO.

(Circuit Court, E. D. New York. June 1, 1909. 169 F. R. p. 833.)

1. COPYRIGHTS-INFRINGEMENT-INJUNCTION.

An unfair saving of labor and expense by the appropriation of the copyrighted work of another, animo furandi, is ground for injunction against the infringing publication, if the unfair use permeates the work to any material extent.

2. COPYRIGHTS—INFRINGEMENT—REMEDIES—INJUNCTION—DAMAGES.

Where the damage by the infringement of an alleged copyright embraced only the expense of additional copying, or if the sale of the work in itself caused no unfair competition and no appropriation of literary work, then complainant would not be entitled to an injunction, but would be limited to a recovery of damages for the material appropriated or for the unjust enrichment at the expense of the copyrighted work.

3. COPYRIGHTS-INFRINGEMENT-INJUNCTION.

Injunction may be an appropriate remedy for copyright infringement, even after the copyright has expired, if the unfair taking occurred while the copyright was in force and no adequate legal remedy can be applied.

4. COPYRIGHTS—RENEWAL-NAME IN WHICH MADE—STATUTES.

Under the copyright statute, a valid renewal of copyright can be made only in the name of the author, "or his widow or children if he be dead," and not in the name of the assignee of the person or persons entitled to such renewal.

5. COPYRIGHTS—ABANDONMENT-COPYRIGHT NOTICE—ASSIGNEES.

The rights of an assignee of a copyright are limited to the rights originally obtained by the filing of the copyright, the assignee being bound as the original author in so far as the abandonment of the copyright or the loss of rights to the material copyrighted is concerned, by failure to follow the statutory requirements, or through a publication of such a portion of the work as may require a repetition of the statutory notice if the material is not to be released.

6. COPYRIGHTS—MATTER SUBJECT TO COPYRIGHT—LAW REPORTING—WORK OF REPORTER.

A law reporter's copyright is limited to the matter which is the result of his own intellectual labor, and, so far as the official reports are concerned, comprises only the syllabus and the statement by the reporter if not filed as a part of the decision; the opinion, the statement of facts if filed as part of the opinion, the arrangement of cases when printed in chronological order in an official publication, and the list of titles or index being public property, and not subject to copyright.

7. COPYRIGHTS-MULTIPLICATION OF COPIES—INFRINGEMENT—REMEDIES.

An author's right to multiply copies and to prevent the appropriation of copyrighted material by others, granted by Rev. St. § 4952 (U. S. Comp. St. 1901, p. 3406), includes the right to recover damages where damages can be proven, and to an injunction if an appropriate or necessary remedy as provided by sections 4967, 4970 (U. S. Comp. St. 1901, p. 3416).

8. COPYRIGHTS—INFRINGEMENT—EXTENT.

To constitute an invasion of a copyright it is not necessary that the whole work should be copied, nor even a large portion thereof, in form or substance, it being sufficient that so much is taken that the value of the original is sensibly diminished, or the labors of the original author are substantially and to an injurious extent appropriated by another.

DAIMLER MFG. CO. et al. v. CONKLIN.

(Circuit Court of Appeals, Second Circuit. April 13, 1909. 170 F. R. p. 70.)

PATENTS—INFRINGEMENT—USE OF ARTICLE BROUGHT FROM FOREIGN COUNTRY.

The use of an article covered by a United States patent in the United States can no more be controlled by foreign law than its sale can, and a purchaser of such an article in a foreign country, although from one there authorized to sell it, is chargeable with infringement if he brings it into the United States and there uses it.

HILLARD v. REMINGTON TYPEWRITER CO.

(Circuit Court of Appeals, Second Circuit, April 13, 1909. 170 F. R. p. 73.)

1. PATENTS—ANTICIPATION—SCOPE OF MACHINE.

The scope of a machine, alleged to be an anticipation of a later patented machine, is co-extensive with the range of adjustment of parts which its construction intelligently provides for.

2. PATENTS—ANTICIPATION — TYPEWRITER ESCAPEMENTS.

The Hillard patents, No. 554,874 and No. 580,281, for related improvements in typewriter escapements, are void for anticipation by a machine made by one Diss in 1890, which embodied the essential features of the patented devices.

BABCOCK & WILCOX CO. v. TOLEDO BOILER WORKS CO. (two cases).

(Circuit Court of Appeals, Sixth Circuit. May 18, 1909. 170 F. R. p. 81.)

1. PATENTS—SUIT FOR INFRINGEMENT—ESTOPPEL.

A corporation charged with infringement of a patent is not estopped to deny its validity merely because the patentee who sold and assigned it is a subordinate in its employment.

2. PATENTS—INVENTION—IMPROVEMENTS IN WATER-TUBE BOILERS.

The Park patents, No. 747,329, for a baffle wall brick used in the construction of baffle walls of water-tube boilers, and No. 744,015, for a hand-hole cover for closing the hand-holes in the headers of water-tube boilers, are both void for lack of patentable invention over the prior art.

MITCHELL v. INTERNATIONAL TAILORING CO.

Circuit Court, S. D. New York. April 29, 1909. 170 F. R. p. 91.)

1. PATENTS—SUBJECTS OF PATENTS — ADVERTISING CARD.

An advertising device made of cardboard is a manufacture, and patentable as such, if novel and involving invention.

2. PATENTS—INVENTION—ADVERTISING DEVICE.

The Mitchell patent, No. 861,747, for an advertising device, held not void on its face for lack of novelty or invention.

AMERICAN TOBACCO Co. v. POLACSEK.

(Circuit Court, S. D. New York. May 5, 1909. 170 F. R. p. 117.)

1. TRADE-MARKS AND TRADE-NAMES—INFRINGEMENT—EVIDENCE.

In a suit to restrain the infringement of a trade-name used in the sale of tobacco, the introduction of two packages of tobacco having the same name and apparently manufactured by different individuals is irrelevant when unaccompanied by proof of the circumstances surrounding the origin and use of the packages.

2. TRADE-MARKS AND TRADE-NAMES—"VIRGIN LEAF."

The trade-name attached to complainant's tobacco "Virgin Leaf" was not synonymous with "Virginia Leaf," nor was it descriptive of the tobacco used, but was an arbitrary, fanciful name intended to denote the purity of the tobacco, and was therefore a valid trade-name.

3. TRADE-MARKS AND TRADE-NAMES—INFRINGEMENT—INTENT TO MISLEAD.

A competitor may not use a name, whether fictitious or real, a description, whether true or not, which is intended or calculated to represent to the world that his business is that of another, and by such fraudulent misstatements deprive the latter of business which would otherwise come to him.

4. TRADE-MARKS AND TRADE-NAMES—INFRINGEMENT—INJUNCTION.

Where complainant and its predecessors for over 60 years had used the trade-name "Virgin Leaf" to designate a brand of fine-cut tobacco, and defendant used such a name in connection with his sale of cigarettes, repudiating any intent to deceive the public, but claiming his use of the word to be a substitute for "Virginia" and descriptive of the tobacco of which the cigarettes were made, complainant was entitled to a preliminary injunction, defendant being relegated to his right to use the word "Virginia" instead of "Virgin."

RUSHMORE v. MANHATTAN SCREW & STAMPING WORKS.

(Circuit Court, S. D. New York. March 2, 1909. 170 F. R. p. 188.)

PATENTS—SUITS FOR INFRINGEMENT—VIOLATION OF INJUNCTION-SALES IN FOREIGN COUNTRY.

An injunction against the infringement of a patent is not violated by the sale of infringing articles manufactured before the injunction was issued in a foreign country.

DONALDSON v. ROKSAMENT STONE CO.

(Circuit Court E. D. New York. April 29, 1909. 170 F. R. p. 192.)

PATENTS — INFRINGEMENT — PROCESS OF MAKING ARTIFICIAL STONE.

The Stevens patent, No. 624,563, for an improved process of forming artificial stone, the principal feature of which is the use in the mold of relatively dry sand to extract the moisture from the plastic stone compound from which the blocks are cast, was not anticipated, and discloses invention, the process being novel and one of a high degree of merit. Also held infringed.

CRIER v. INNES et al.

(Circuit Court of Appeals, Second Circuit. March 16, 1909. 170 F. R. p. 324.)

1. PATENTS — SUITS FOR INFRINGEMENT—EFFECT OF PRIOR DECISION.

As a general rule, which may be subject to exception in particular cases, when a patent after full hearing has been declared valid by a Circuit Court and its decree has been affirmed by the Circuit Court of Appeals, such decision will be followed by the latter court in a subsequent case involving the same patent, and not presenting any essentially different evidence, even though the claim of invalidity was not urged on such court on the prior appeal.

2. PATENTS — DESIGNS FOR "MANUFACTURE"—MONUMENT.

A sarcophagus monument is a "manufacture" within the meaning of Rev. St. § 4929 (U. S. Comp. St. 1901, p. 3398), and a proper subject for a design patent.

3. PATENTS — VALIDITY AND INFRINGEMENT — DESIGN FOR MONUMENT.

The Young design patent, No 27,115, for a design for a sarcophagus monument, discloses novelty and invention, and is valid; also held infringed.

4. PATENTS-SUITS FOR INFRINGEMENT-PERMANENT INJUNCTION.

The fact that defendant has ceased to infringe, and has promised not to infringe in the future, does not necessarily prevent the granting of an injunction against him, but, as an injunction is only granted to prevent threatened injury, it should not issue if it is clear that no further infringement is to be anticipated.

5. PATENTS—SUITS FOR INFRINGEMENT—PENALTY FOR INFRINGEMENT OF DESIGN PATENT.

To entitle the owner to a design patent to recover the statutory penalty for its infringement provided by Act Feb 4, 1887, c. 105, 24 Stat. 387, Supp. Rev. St. 533 (U. S. Comp St. 1901, p. 3398), he must have duly marked the patented articles made or sold by him, where there is no proof of infringement by defendant after notice.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Joseph M. Glick and William J. Glick, Bridgewater, Va. Harrow.—This invention has for its object to provide a harrow, equipped with a device adapted to be easily operated without stopping the team, and capable of reducing the side draft to a minimum when cultivating on hillsides, and of also preventing a harrow, equipped with staggered teeth, from shifting downward and causing two or more teeth to follow the same line and thereby impair the efficiency of the harrow.

James A. Fuller, Roswell, Ga., inventor; W. A. Teat, Atlanta, Ga., assignee. Cotton Chopper.—An object of this invention is to produce a cotton chopper, capable of ready adjustment to suit the size of the cotton plants and the character of the soil, and adapted to remove the soil from each side of the cotton plants preparatory to thinning out the same, and to guide the plants to the cutting means, whereby the plants may be accurately cut to the desired extent and the uncut plants left at regular intervals. Another object of the invention is to cultivate the soil at each side of a row of cotton plants, and to provide means for throwing the soil towards the plants after the chopping operation has been completed.

William V. Harding, Kansas City, Mo. Stock Feeder.—An object of the present invention is to provide a stock feeder, designed for feeding alfalfa, clover, hay and various other feeds economically to hogs and other stock, so as to obtain maximum results at a minimum cost. Another object is to provide a stock feeder, adapted particularly for feeding material in comparatively small rations, and capable of effectually preventing the animals from interfering with one another while feeding.

John A. Heintz, Minneapolis, Minn. Two patents.—It is the aim of the invention of the first patent to provide a sleigh knee of the oscillatory type, adapted to permit the necessary play of the runners when passing over uneven surfaces of the ground without straining the parts. and capable of enabling the parts to be readily detached to permit the dismemberment of the structure.

The second patent covers a safety seat fastener, adapted to be readily applied to the seat of a sleigh, wagon, buggy, or other vehicle, and capable of adjustably securing the seat to the box or body and of preventing the seat riser from splitting and the box or body from spreading.

Albert A. Kellogg, Clinton, Mo. Mail Box.—The principal object of the invention is to provide a mail box, designed particularly for use in large cities, where mail is collected at short intervals, and where hotels, office buildings, and the like are equipped with interiorly arranged mail boxes, said box being adapted to display a signal for indicating the presence of mail matter, whereby when such signal is not displayed, it will be unnecessary for a letter carrier to open the box, thereby effecting a great saving of both time and labor in the collection of mail. The signal will be unaffected by the opening and closing of the lid of the box, and will be displayed only when a piece of mail matter is deposited in the box.

Frederick A. Lane, Manchester, N. H. Truss.—An object of the present invention is to mount the truss pad on the supporting belt in such a manner that the tension or pressure upon the body will be substantially uniform upon all sides, whereby the pad will readily accommodate itself to the movements of the wearer and thereby render the device comfortable and effective. Another object of the invention is to provide a truss, equipped with a pad, adapted to cover a comparatively large area and yield at the center so as to become dished or cupped when in applied position, and thereby encompass the injured portion instead of being forced into the same as in the "plug" type of truss.

Miles Livingston, Herscher, Ill. Drenching Bottle.—The object of the present invention is to provide a practical drenching bottle, capable of enabling the lips of an animal to close enough to permit it to swallow naturally, whereby medicine may be administered to the animal without either injuring the same or spilling the medicine.

Paul Lier, Emerson, Neb., inventor; Gus A. Isenburg, Emerson, Nebraska, assignee. Disk Holder or Rest.—An object of the present invention is to provide a disk holder, adapted to save time and labor in handling cultivator and plow disks, while sharpening the same by hammering them out on an anvil. The device is adapted to support a cultivator disk in proper position on an anvil, and it prevents the disk from jumping around the anvil and springing out of shape while it is being operated on by either a hand or trip hammer.

Thomas Meyer, Chicago, Ill. Broom Moistener.—It is the aim of the present invention to provide a broom moistener, adapted to be applied to an ordinary straw broom, and capable of enabling the discharge of water to be readily controlled, whereby a too rapid and undesirable discharge of the contents of the moistener is prevented. The broom moistener is equipped with a plurality of discharge tubes arranged to deliver the moisture to the broom head at one side or face thereof, and capable of being reversed to arrange the discharge tubes at either side or face of the broom.

Dwight C. Mitchell, Gasport, N. Y. Two patents.—The principal object of the invention covered by the first patent is to obviate the difficulty often experienced in drawing four-in-hand or other neckties through doubled or turned down collars, and to provide a necktie that will slip freely through a turned down or similar collar and securely hold its position when tied.

The second patent relates to a game apparatus, adapted for either indoors or outdoors, and capable of affording both exercise and amusement by combining the features of the game of bowling with some of the features of base ball and other like games, and capable of increasing the sport incident to bowling by causing the ball thrown by the player to release ball-throwing mechanism, which projects a ball in the direction of the player to be caught by him.

William J. Miles, Jr., Middletown, Ohio. Razor Stropping Device.—The object of this invention is to provide a razor stropping device, adapted to be applied to either safety razors or a common razor, and capable of retaining a razor blade flat upon a razor strop, while stropping the same, whereby the edge of the razor will be effectually prevented from being rounded by such stropping operation. By this device, a razor may be stropped in the ordinary manner, means being provided for engaging the back of a strop and of preventing the rear edge of the razor from being lifted from the strop, whereby the razor blade will be caused to move over the strop in a perfectly flat position.

Albert W. Noonan, Britt, Iowa. Neck Yoke Center.—The present invention is designed to produce a neck yoke center, constructed of leather and equipped with a safety catch, adapted to effectually prevent the tongue or pole supported by the neck yoke from dropping, in case the traces should become detached. The neck yoke has a body portion constructed of a continuous strap of leather forming complete loops for receiving both the neck yoke and the tongue or pole, without relying on rivets in the formation of such loops.

Martin Paulson, Omaha, Neb., inventor; The Paulson Grain Door Co., assignee. Grain Door.—An object of this invention is to provide a pair of grain doors, adapted to effectually prevent the escape or loss of grain at car doors, and capable of being readily placed in position and of being easily opened and quickly removed, without first removing a portion of the grain to relieve the grain doors of the interior pressure.

James D. Perrott, Beaver Falls, Pa. Adjustable Window Shade Fixture.—This relates to an adjustable window shade fixture, adapted to permit a window shade to be raised and lowered bodily to arrange it over any portion of a window, so as to provide light and ventilation above the window shade. Another object of the invention is to enable the unrolled portion of a window shade to be arranged in practically the same plane as the supporting cords without materially affecting the vertical position of the spring journal, whereby the latter will always be maintained in proper position to be engaged by the ratchet device for holding the shade roller stationary.

Frank C. Perrott, Beaver Falls, Pa. Two patents.—The first patent covers a cord clamp designed for window shades, awnings, transoms, etc., and adapted when a cord or rope is pulled upon, to permit the same to be drawn readily through it for enabling the shade, awning or the like to be raised, and capable of automatically gripping such cord or rope for securing the same in its adjustment when released by the operator.

It is the aim of the second patent to provide a window shade adjuster, adapted with slight changes to be applied to either the outer face or to the inside of a window frame or casing, and capable of ready adjustment to enable the window shade to be lowered any distance from the top of the window within the limits of the device, and of permitting the shade to be freely worked on and off the roller. The mechanism is equipped with anti-friction devices, arranged to permit the window shade to slide freely in its upward and downward movements, and to positively move downward through gravity without binding.

Robert A. Rose, Santa Rosa, Cal., inventor; George C. Holbrook, Santa Rosa, Cal., assignee. Gearing for Motor Vehicles.—The present invention has for its object to produce gearing, designed for transmitting power to and driving the front wheels of an automobile, or other motor vehicle, without interfering with the steering of the vehicle.

John Hagedorn, Salem, Mo. Spring Cultivator.—An object of this invention is to provide a cultivator, designed particularly for use on rocky and stumpy ground, and having resilient cultivating devices, which will not be broken should they come in contact with a rock or stump. Another object of the invention is to provide a cultivator with a lateral movement and adapted to be easily shifted from one side to the other for dodging corn or a stump, and also for moving it upward when cultivating a hillside, whereby the cultivator is prevented from slipping down the same.

Milton A. Smith, Port Huron, Mich. Carpet Stretcher.—The present invention relates to a carpet stretcher, adapted to be easily and quickly operated to successfully stretch a carpet in any direction, and capable of holding the carpet at the end of each stretching operation while it is being arranged for the next operation. The device is adapted to be advanced as the carpet is stretched, and after a carpet has been sufficiently stretched, it is held with slack at the edge, whereby the carpet may be tacked with greater facility.

William P. Smith, Kinards, S. C. Fertilizer Distributer.—It is the aim of the present invention to provide a fertilizer distributer in the form of an attachment, adapted to be applied to any ordinary plow, and to be advantageously employed for planting seed, and capable of adjustment on a plow to discharge the fertilizer either in advance or in rear of the foot or shovel of the plow.

Philip H. Stauch, Chicago, Illinois. Two patents.—The first patent covers an automatic digger and conveyer, designed particularly for use in gold fields for digging into sand and the like, and adapted to convey such material from the point or place where it is dug to a convenient point for separating the particles in different sizes.

The second patent relates to motors, operated by motive fluid under pressure, or motive fluid and hydraulic power combined, and its principal object is to provide an effective apparatus, which can be readily installed, and capable of having a comparatively great amount of power stored therein, and one which can be easily regulated and controlled.

Albert H. Sites, Ashland, Ohio. Barn Door Shield or Cover.—An object of the present invention is to provide a shield or cover, adapted to be readily applied to a sliding barn door or similar closure, and constructed to cover the open space between the upper edge of the door and the side of the barn, and protect the track and rollers or wheels from the weather. Another object is to provide a cover or shield having supporting angles, adapted to form lap joints for enabling a shield or cover of any number of separate sections to be employed.

Frank Steelman, St. Paris, Ohio, inventor; Samuel P. Smith, and Charles S. Bollinger, St. Paris, Ohio, assignees. Cushioned Horse Shoe.—An object of this invention is to provide efficient means for cushioning the heel calk of a horse to prevent soreness and lameness, and to render much easier the travel over hard surfaces of paved streets, roads, etc. It it also an object of the invention to provide a cushioned horse shoe, adapted to admit of easy removal of the heel calks and the cushions without taking the shoe off a horse's hoof.

Heman W. Stone Jr., Morris, Minn. Wire Looper.—The principal object of the present invention is to provide a compactly arranged tool, adapted to be conveniently carried in the pocket, and capable of being operated by the handle of a hammer or other lever, a loop being formed in the shank of the tool for the passage of the handle of a hammer.

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WASHINGTON, D. C., JULY 1, 1910.

Report of Commissioner of Patents.

Twice a year a report is made to Congress of the operations of the Patent Office—one for the fiscal and one for the calendar year. While there are marked changes in the work during the six months that separate the two periods, the last report includes a number of interesting recommendations.

The receipts from all sources for the calendar year, were $2,042,828.14, and the expenditures $1,955,151.14, leaving a surplus to the credit of the Office of upwards of ninety thousand dollars for the year, which added to the previously existing surplus amounts in round numbers to $6,980,000, representing the earnings of the bureau now held in the Treasury. About 66,000 applications for patents were filed, of which 37,000 were issued. Twenty-two thousand patents expired. It is a curious fact that upwards of eight thousand allowed applications, or roughly speaking nearly an eighth of all those filed in the office, were forfeited on account of failure to pay the final fee of twenty dollars. The payment of this amount would have caused the patents to issue.

The Commissioner urges the classification of the vast amount of material which has been accumulating for almost a century, covering domestic and foreign patents and the contents of forty thousand volumes in the scientific library. All these should be subject to reference in the searches that are made to determine the patentability of inventions. It is obvious that classification would greatly simplify and facilitate the work of examination. It would also expedite the work of issuing patents; but what is more important, it would cause the patents granted to have a greater degree of validity than is possible under the present system, owing to the incomplete and unsatisfactory character of the examinations that is inevitable in view of the mass of undigested material with which examiners as well as inventors are confronted.

Only about 42 per cent of the United States patents have been classified, and these patents number to date 954,966. They are increasing at the rate of between thirty-five and forty thousand a year. A classification division has been established, and a force of ten men is now engaged in this work, but it is clear that this number is quite inadequate to the task and Congress is asked to double it in order that the work may be speedily completed. The grant of patents whose novelty, if not validity, is assured, would dispense with much of the litigation in which inventors are now involved, through suits for infringements and interferences.

The efforts of the American Bar Association to establish a court of patent appeals are heartily approved. Legislation to accomplish this end should be passed at the earliest possible moment. The new court would have jurisdiction to determine appeals and writs of error from judgments in circuit courts relating to patents. The fact that such judgments as now rendered are frequently contradictory causes serious confusion, and it is clear that the practice should be unified.

The Commissioner calls attention again to the necessity for legislation which would result in the establishment of a patent bar, which would raise the dignity, efficiency and standing of patent attorneys, by requiring applicants for permission to practice before the Patent Office to pass examinations as to moral, legal and technical qualifications before they are admitted. He also urges the passage of bills now before Congress, to shorten the time in which an applicant may prosecute his application from one year, as now provided, to six months; to require the filing of two photographs of the drawings as a part of the application for patent, in order to prevent tampering with the application after it has been filed; and to change the word "claimant" to "patentee" in the patent statutes. The former, he thinks, is not the proper expression, since an application for patent is not a claim against the government. Another bill authorizes the issue of certificates of correction to Letters-Patent. These certificates are now issued under the rules of practice, but objection has been made to them in the courts on the ground that they are not specifically authorized by law. It sometimes happens that a patent in the course of its printing by the Government Printing Office does not conform in all respects to the records and files of the Patent Office. This bill authorizes the Commissioner to issue a certificate of correction whenever, in his opinion, a patent as issued does not conform with the records and files of the Patent Office.

The report adds:

"The official International Congress for the Protection of Industrial Property was invited by the President of the United States to hold its next congress in the city of Washington in May, 1910. An appropriation of $10,000 was made at the first session of the present Congress to defray the expense of the gathering.

In communicating with the International Bureau of Berne, Switzerland, it was learned from the Director of said Bureau that there would not be sufficient time for the various nations participating—some thirty-five in number—to prepare material to be considered by this congress, and upon the recommendation of the Commissioner of Patents the Department of State has changed the date of assembling to May 21, 1911.

This congress will be composed of delegates representing the foreign nations, and whose credentials will empower them to enact and sign any measure that shall be passed by said congress, subject, however, to the subsequent approval of their respective governments. The meetings of this congress will probably be the most important in its history. Able and experienced delegates, mostly officials of the various nations, will be appointed, who will discuss and act upon measures to bring about international concessions and agreements in patent and trademark laws, thereby harmonizing the laws of various countries, which laws are at the present time widely at variance, so much so in fact that it is almost impossible for inventors and manufacturers to do business with any degree of satisfaction in the various countries."

One question upon which it is important to obtain uniformity of practice is that relating to the working of patents. As we have already noted in these columns, most foreign countries require this working, or in other words require the invention to be manufactured and actually placed on the market within their territory, within a certain period after the grant of the patent. The United States laws contain no such requirement, and the obligation is frequently found to be embarrassing and hampering to American inventors who take out foreign patents. Negotiations are now pending with various foreign countries looking to agreements for the elimination of this provision. Such an agreement is now in force between this country and Germany, and the working clause in the patent laws of Sweden and Switzerland has been recently eliminated. It is to be hoped that some international convention to this effect will be reached.

Slippery Finance.

Inventors are proverbial victims. A patent attorney who was achieving great success in fleecing unwary inventors declared some years ago, before his methods came up for official investigation and he was disbarred from practice before the Patent Office. "A sucker is born every minute." Many attractive and misleading advertisements appear in the press "Inventions Wanted—One Hundred Thousand Dollars for an Invention—Patent your Ideas" worded in such a way as to mislead the man who has evolved a device which he considers valuable. Thousands of such inventors are deluded by these advertisements into applying for patents upon inventions that have already been covered. In some cases the attorneys demand their fees in advance, and then make no effort to obtain the patents, knowing that the devices are old. In other instances—and this is the most common—they obtain a patent that is absolutely worthless, that would not stand an hour's investigation, and that affords no protection to the owner. Some clever attorneys issue "certificates of patentability," purporting to guarantee that a patent can be obtained. Often inventors are deceived by these, and believe them to afford much the same protection as a patent, when as a matter of fact, they are not worth the paper they are written on.

But even when a man has a good invention and has obtained a valid patent, his troubles are not over. Other sharks are lying in wait for him. His next object is to sell his patent, or to incorporate a company for its manufacture. "Incorporation" has an alluring sound for the man who wishes to put on the market an article for which he believes the world has been waiting. And he is flooded with generous offers to sell his patent, or to form companies to exploit it. Believing in it as he does, it is only natural for him to think that other people believe in it too. The patent selling concerns are usually frauds pure and simple. They always demand a fee in advance, and having pocketed it, their interest in the matter subsides. The incorporation firms operate on lines that are more subtle, but equally slippery. They advertise to arrange financial assistance "for legitimate corporations." Stock and bond issues are to be prepared and sold promptly. Corporations will be organized and established without delay. The firm is located in the heart of the city, under the same roof with old and well known financial institutions, and the officers present every appearance of prosperity. Often these pickpockets of finance work in combination, aiding one another in their attempts to deceive the seekers for capital. When one of them wishes to supply references, it simply gives the name of a similar firm, and they endorse each other unhesitatingly. When an inventor writes to the company he receives a seductive letter in reply, declaring that they will be pleased to look into the matter if the enterprise is legitimate. Their time is too valuable, they declare, to be wasted with triflers, and only meritorious propositions are considered. They infer from the character of their correspondent's letter, however, that he is not the kind of man who would give attention to an impractical or highly problematical proposition. So they ask him to call, and the confidence game is started. The bogus promoter sometimes merely extracts whatever amounts he can for incorporating a company, and failing to sell the stock, the deal is closed so far as he is concerned. No attempt of course is made to sell the stock. But unless the victims can prove intent to defraud, which is practically impossible, they have no redress.

Another scheme is to inform the inventor that it would be easy to dispose of the stock if it were guaranteed by paid up endowment life insurance policies, or by a company making it a business to guarantee stocks and bonds. Plausible sounding statements as to the standing of the concern, its ability to float stocks and bonds, its clientele of investors waiting for something good to put their money into, naturally fascinate the man who needs money and who

believes he has a good proposition to develop. A large fee, generally one per cent of the amount of capital stock to be sold, must accompany the application for the policies. The fee is paid, but no stock being sold, no guarantee is issued.

Numbers of swindlers, preying upon credulous men in the manner above described and in other similar ways, have been discovered by the police and postal authorities, and their establishments have been broken up in almost every large city; but they bob up under a different name. They are the bane of the large commercial agencies, and it is due, in part, to the constant vigilance of these agencies that the fake promoters do not secure more victims. But they manage to secure many in spite of every precaution, and the man with a patent to sell or develop cannot be too much on his guard.

To Inspect Ship's Hulls.

Every vessel in the United States navy will carry its dry dock with it, if the Navy Department accepts an invention about to be offered to it. Not that the device will entirely supersede dry docks, but it will enable the crew to clean, in a fairly thorough manner, the foul bottom of a ship in seas where dry docks are not available. It will permit the replacing of a lost propeller at sea, or the repairing of moderate injuries below the water line, and, what is most important, will enable the officer in charge to descend at will to inspect the submerged portions of the hull.

Had the Navy been equipped with this device on its trip around the world, the jackies could have gone over the hulls at almost every stopping place, and kept the bottoms at least reasonably clean, whereas all the ships had to be ordered to dry dock soon after their arrival in home waters, and thousands of dollars were spent scraping their hulls. Had the Navy possessed one of these tube-caissons, as they are called, when the Maine went down, instead of relying on the reports of divers, as the court of inquiry was compelled to do, the members of the court could have descended at their leisure and made a thorough examination for themselves. Even now this would be possible, if the Maine were not sunk so far in the mud of Havana harbor. The caisson consists of a flexible steel ribbed tube, which, when extended, makes a well in the water. At the bottom is a work chamber, fitted with bull's eyes and rubber arms, so that the men in the chamber can look out, see what they want to do, and do it by means of the rubber sleeves. Several officers of the Navy Department are said to have inspected the operation of the device, and their reports are of a flattering character.

Big Telescopes.

The largest astronomical instrument in the world has been mounted in the observatory at Harvard—a five-foot reflecting telescope. This is 20 inches wider than the Yerkes telescope, and the biggest made up to this time, except the famous Lord Ross instrument, which had a six foot reflector, and was erected in Ireland in 1842. This did not give satisfactory service, and was abandoned years ago. All the famous telescopes of the world, however, will be put in the shade with the completion of a mammoth sky searcher which is now under process of construction for the Mt. Wilson observatory at Pasadena, California.

This new instrument is not the conception of a hair-brained theorist, but is projected by one of the most eminent astronomers of the day, Professor Hale, for years at the head of the astronomy department of the University of Chicago. The object glass of this instrument, which is to cost $40,000, will be a disk of solid plate glass 100 inches in diameter and 13 inches thick. This glass, which will weigh 4½ tons, will be cast in France, where nearly all such glasses are made. It must be absolutely without flaw and as clear as it is possible for crystal to be. The gigantic pane will then be shipped half around the world to California, and ground, polished and tested in the observatory workshop. The erection of the telescope, which will be nearly twice the size of any other in use, was made possible through a gift of $40,000 for the express purpose by John D. Hooker, of Los Angeles. It will require several years to complete the work, the grinding and polishing taking most of the time. A special grinding machine has been constructed for working it; also a mirror 54 inches in diameter and several smaller plane and convex mirrors. When finished, the telescope will have an aperture of 8 feet 4 inches, and a length of 50 feet. A building which can be maintained at an even temperature will be constructed for mounting it.

Few persons except astronomers have any idea of the wonderful sensitiveness of the lens of a telescope. These marvelous artificial eyes can be produced only by the exercise of the most scrupulous care in the selection of the glass, consumate skill and inexhaustible patience. Alvin Clark, the well known lens manufacturer of America, wishing on one occasion to illustrate the sensitiveness of an instrument, held his hand under it about two feet away. At once the great glass disk seemed to be transformed into a volcano, spurting forth jets of flame. Waving and leaping, the tongues of light gleamed and vibrated, and then slowly died away, leaving the lens reflecting only a pure, untroubled light. The whole phenomenon was due to the radiation of heat from the hand, alternately expanding and contracting the glass. If the hand had been laid upon the lens itself, the results would have been still more violent. This almost supernatural responsiveness of a mass of glass weighing hundreds of pounds amazes the ordinary observer, but it is an everyday matter to the scientist, for he has instruments that will register with unfailing accuracy the approach of a person 50 feet away.

In spite of this sensitiveness, the image formed by big telescopes is not always distinct. This was the drawback to the Ross instrument above mentioned. It had a mirror of speculum metal, and while it possessed great magnifying power, the resultant image was worthless for practical purposes. It is hoped that the new sky searcher will give a clear and distinct definition. There are some lines of work, such as measuring the heat radiation of stars and spectroscopic study of faint stars, in which it is sure to be of value: and with the excellent atmospheric conditions usually prevailing at Mt. Wilson, it is certain to be the means of adding largely to our astronomical knowledge, even though the story of the canals of Mars may not be deciphered through its agency.

Watching Flowers Grow.

One remarkable fact about the moving picture camera is that it is able to reproduce not only the swiftest objects, but the slowest as well. It is now possible to exhibit pictures of a flower in the different stages of growth, and of the transition of a blossom into fruit. Recent experiments have resulted in a process that throws on the screen the changing of a rosebud into a full blown rose, the burst of a lily from its leafy prison and the slow unfolding of a fern.

The operation of exhibiting anything like the development of a flower from birth to maturity requires of course considerable time, though the result consumes not more than five minutes when thrown upon the screen. The negatives must be made at regular intervals of time according to the degree of the plant's growth, while the exposure must continue day and night until that point is attained at which it is presumed the object has really reached its maturity. The method in the case of the rose, for instance, is as follows: Just as soon as the bud begins to show the first film is exposed, and from that time on until the blossom is full blown a fresh negative is exposed every ten minutes, both day and night. The time of exposure varies of course according to the season, the warmth of the green house, the species of flower, etc. Generally, however, less than three weeks are required for the completion of this work. In this time, something like 2400 films are exposed, which are not so many when it is considered that most moving pictures of animate objects carry some 10,000 to 20,000 separate and distinct photographs. At night, the negatives are taken by means of an arc light.

One of the prettiest effects gained by the moving picture camera is that shown by the emergence of a butterfly from its chrysalis. The films for this were exposed with a fair degree of rapidity, since a butterfly takes but a few minutes to develop, once it has shed its shell. The insect employed in the experiment was of the peacock variety. In order to obtain sharp negatives, the chrysalis was placed in the open, the camera focused upon it, and then many days passed before a slight movement indicated that the beautiful prisoner was about to emerge. Before the chrysalis actually broke a negative was made: and then as the butterfly began to liberate itself the films were run off very rapidly and the speed was increased as the insect commenced to greet its wings. The final photo shows the butterfly floating away in a clear blue sky until it passes from sight.

Rejuvenation of Poles.

After a severe storm, a great number of telegraph and telephone poles are always found prostrate in the section so visited, and it is noticeable that they are broken off just at the surface of the ground. An examination of any wooden pole that has been standing five or six years will show that it has become decayed for a space of from 1 to 3 feet below the ground. The problem of renewing the pole, or strengthening it in some way, has been one that has received much attention from engineers, and only recently has it been solved in a practical manner. Concrete, that is daily being adapted to new uses, finds application here also. The *Technical World* describes the manner of its employment. The pole is supported in place by guy wires, and the earth removed to a depth that will expose the solid portion of the end remaining below. The decayed part is then scraped out and steel rods several feet long and half an inch in diameter are used for reinforcing. The rods are sharpened at both ends, the upper end being bent at a right angle, while the lower end is left straight. This straight end is driven into the solid part of the butt end of the pole by means of a special driving tool. The upper end of the rod is now bent in toward the pole, and the angular point driven in to its full length. The rods are long enough to permit the proper entry of their lower end in the sound wood at the bottom of the pole, and to allow the portion extending above the earth to span the decomposed section and be driven into the sound wood of the upper part. From 4 to 8 rods are generally used.

The concrete is now filled in, replacing the decayed wood and forming a protective sleeve surrounding the pole and enveloping the rods to a thickness of about 6 inches. This sleeve extends above the ground far enough to cover the upper terminals of the rods, thus forming a kind of collar tapering from 3 inches in thickness at ground level to about an inch at the top. Where the butts are partially rotted away, the space is filled in with the concrete, forming an anchorage for the rods either in solid wood or cement: but if entirely rotted away, the concrete base is made large enough for the reinforcing rods to be anchored at the bottom. The pole is then cut off squarely and allowed to rest on the concrete base. This method of reinforcing forms practically one solid mass of the pole and base, and is far superior to a wooden pole when new. The process is so simple that ordinary workmen learn how to do it within a few days. The average cost per pole is not over $3 50. Some 50,000,000 wooden poles are used by electric companies in this country, and it is estimated that they will require renewing at the rate of 3,500,000 a year. With the constantly increasing price of lumber, this method will prove a great money saver.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Pipe fitting, Drainage.....E. D. Tucker
Pipe-joint, Flexible.....G. F. Barron
Pipes, rods &c., Coupling for.....J. E. Harriman, Jr.
Planter, Hand.....M. M. Logan
Planter, Potato.....J. Hadie
Plastic material, Producing objects from.....Z. Olsson
Pliers.....R. I. Metzger
Plow.....E. E. Bradfield
Plow for steam cultivation, Disk.....R. H. Fowler et al
Plow harrow attachment, Wheeled.....J. R. Naylor
Plow-reversing mechanism.....J. P. Field
Plow, Traction gang.....C. J. Johnson
Poke, Animal.....H. S. Watrons
Post-anchor.....J. Laux
Power-transmitting device.....A. W. Whitcomh
Precious stones, Setting for.....V. A. Gebhardt
Press.....A. G. Mead
Press.....R. F. Haerry
Press-bed.....F. C. Leethem
Presser-head.....W. H. Fisher
Printing-cylinders, Plate-locking device for.....V. Filteau
Printing-form for printing advertisements..J. S. Dittmar
Printing-plates in grain manner, Preparing.....H. S. Anfermann
Printing-plates, Machine for making.....J. S. Duncan
Printing-press.....H. R. Moore
Printing-presses, Cutting-stick for.....S. Kaufman
Printing warps, Machine for..A. C. Schoen
Propecting apparatus.....F. F. Fiallo et al
Propeller.....A. von Parseval
Propeller, Feathering-blade.....C. W. Van Winkle
Propeller, Reversible.....H. Pawlik
Propelling means, Boat.....W. Cutler
Pulp-agitator.....R. W. Gordon
Pulp, Apparatus for forming receptacles from.....C. F. Homburg
Pulp-extractor.....W. H. Janney
Pump.....F. Schmidt
Pump.....H. P. Petersen
Pump, Detachable.....G. W. Kellogg
Push-switch.....J. G. Peterson
Push-switch.....C. E. Anderson
Rack or cabinet.....E. H. Hitchcock
Radiator.....J. Kane
Rail-fastener.....G. Porter
Rail-joint.....C. L. Bundy
Rail-joint.....H. F. Roach
Rail-joint.....R. G. Mnsgrove
Rail-joint.....G. W. Klinker
Rail-joint.....J. F. Wessel
Rail mounting, Guard.....L. R. Bishop
Rail support and brace.....P. Poirier
Rake and hoe, Combined.....J. Dalpay
Ratchet mechanism.....G. O. Leopold
Razor, Safety.....J. Molkenthin, Jr.
Refrigerator.....J. R. Wood
Regulator: See Damper and air-regulator; Damper-regulator.
Resistant surface and making the same.....C. B. Jacobs
Respirator, Intravaginal infantile.....W. E. Kelly
Rock-drill.....G. W. Smith
Rock-drill.....J. W. Selleck et al
Rolling-mill for producing tubes.....M. Peters
Roof.....W. E. Polhemus
Rope-making machine.....T. M. McIntosh
Rotary engine.....E. A. Bohm
Rotary engine.....C. E. Waldron
Rotary steam-joint.....J. Nuttall
Roundabout.....A. C. Tulene
Rubber-stamp rack.....Z. D. Graham
Rural-free-delivery boxes, Support for....O. W. Randall
Saddle, Harness.....W. E. Pitt
Saponaceous compound.....E. Weiss
Sash-lock.....E. O. Daniels
Sash-lock.....H. A. Bennett
Sash lock and antitrattler.....J. and A. J. De Mars
Sawmill feed mechanism...A. A. De Loach
Scaffold, Hanging.....E. Stranden
Scraper.....J. D. Vasey
Scraper, Block.....G. C. Bemis
Screen attachment..G. P. and P. D. Bnrke
Screen-plate fastener.....M. J. Mollen
Scrubbing device.....J. P. Raymond et al
Seal, Bottle and jar..L. G. Steiminger et al
Seal, Dating nail.....E. J. Brooks
Seal-lock.....G. H. Barker
Sealing device, Carton.....W. S. Scales
Seat and walking-stick, Combined.....W. Schocke
Service-box, Extension.....F. M. Jacob
Sewing-machine.....C. M. Larsen
Sewing-machine.....W. T. Auckram
Sewing-machine attachment....M. McCabe
Sewing-machine cloth-presser.....D. Noble
Sewing-machine presser-foot.....J. S. Johnston
Sewing-machine tension-releasing device..W. C. Free
Sewing-machine trimming mechanism.....J. P. Weis
Sewing-machine work-guide.....J. P. Weis et al
Shade bracket, Window.....F. H. Knapp
Shafts, Making crank.....W. I. Block
Shafts, Means for retaining roller-bearing sleeves on.....C. S. Lockwood
Sheet-feeding machines, Pile-elevator for..B. Gnstafson
Sheet-metal-folding machine.....R. T. Withers
Sheet or card lifter.....C. L. Burdick
Sheet-registering, Automatic.....H. A. W. Wood
Sheep-shearing machine.....D. Lennox
Shingle-machine.....W. S. Hiett
Shingle, Metallic.....J. Grnber
Ships, Apparatus for indicating the speed of.....R. Star-

Shock-absorber.....R. Lépine
Shoe-holder.....L. Sonntag
Shoe-polishing stand.....A. Hoffman
Shuttle.....H. Le Doux et al
Side-delivery rake, swath-turner, &e.....W. E. Martin
Signal device, Automatic.....F. Porto
Signal system, Electric.....A. L. Sohm
Skate, Roller.....J. W. Peters
Skate, Roller.....S. E. Astbury
Skiving-machine.....J. Bushfield
Slime-separator, Centrifugal..J. T. Lindahl
Sound-transmitting instruments, Receiver for.....J. J. Comer
Spark-gap apparatus.....W. Peukert
Spark-plug.....H. F. Provandie
Speed-indicator.....L. A. Kaiser
Speed-recording mechanism....L. L. Bloch
Spigot, Measuring.....W. J. Hughes
Spinning frames, Automatic doffer for fly..N. R. Newsholme
Spinning machines, Waste-cleaner for ring.....R. Koref
Spring-motor.....C. H. Von Hohenstein
Spring-wheel.....2 pats.....P. M. Kling
Sprocket-wheel.....3 pats.....J. M. Dodge
Square and rule, Combination.....C. H. Peterson
Stair-tread.....C. B. Jacobs
Stairway structure.....W. B. Simpson
Steam-superheating apparatus....H. Cruse
Steering attachment, Safety.....H. P. Larouette
Stencil-machine.....C. L. Burdick
Stoker, Mechanical.....J. A. Caldwell
Stool, Motorman's.....W. E. Fawcett
Stopper-tie.....W. S. Dow
Store-front construction.....F. J. Plym
Store-service track.....E. J. Brandt
Stove and staud, Vapor..G. E. Savage et al
Stove, Gas.....A. C. Wituan
Stove, Heating.....A. C. Klopping
Stove, Oil.....F. Conrath
Stud, Collar.....P. Eppelein
Studding, Metal.....H. E. White
Superheater.....J. E. Bell
Superheater-boiler.....J. E. Bell
Supply and overflow fixture, Combiuation..W. S. Graham
Swingletree-hook.....J. B. Johnson
Switch handle, Electric.....J. G. Peterson
Switch throwing and locking device.....A. A. Stock
Talking-machine attachment.....W. S. McNamara
Talking-machine sound-box...R. L. Gibson
Tauk.....J. O. Bewau
Tanks, Liquid-gage for pressure.....A. Verhoeven
Target, Recording.....J. W. Rice
Target-trap carrier.....H. C. Peffer
Tea or coffee pot.....G. E. Curtiss
Telegraph, Priuting.....J. E. Wright
Telegraphy, Apparatus for wireless.....G. Marconi
Telegraphy, Wireless.....G. Marconi
Telephone and fire-alarm or kindred service system, Combined.....W. W. Dean
Telephone and telegraph system, Combined.....G. E. Hines
Telephone, Automatic.....J. E. Rogers
Telephone direction-plate..B. S. Whitehead
Telephone-microphone.....V. Tardieu
Telephone system.....O. M. Leich
Telephoues, Sterilizing and muffling shield for.....F. M. Allen
Tenoning and pointing machine.....F. C. Miller
Thermometer-dial.....C. H. Myers
Thread holder, Bobbin.....E. G. Cone
Threshing-machine feeder.....C. Barnhart
Threshing-machine feeder.....H. J. Boyer
Tie-plate.....W. McKee
Tilling-machine steering-gear...G. Spalding
Tire-chain, Elastic uon-skidding.....C. E. Abrams et al
Tire-heater.....D. L. Brown
Tire-protector.....A. E. Goldman
Tire, Wheel.....G. W. Crawford
Tires. Demountable rim for automobile...W. N. Booth
Tool-hanger.....O. Ruue
Tools, Attachment for repair.....W. L. Dinsmoor
Torpedoes, Turbine-drive of gyroscopic steering-gears of.....A. E. Jones
Toy.....H. G. Starmer et al
Trace-holder.....H. G. Weatherill
Train-stop, Automatic.....S. D. Jarvis
Train-stop, Automatic.....S. M. Duncan
Transfer mechanism.....D. F. Crawford
Transmission mechanism.....J. M. Mack
Traveling-bag or luggage-carrier.....C. Wiedemann
Trimming-machine, Rotary.....L. Muther
Trolley-poles, Automatic safety device for.....M. M. Zellers
Trousers and other garments, Supporting-band for.....C. A. Blake
Trunk and suit-case lock..H. F. Crim et al
Turbine-engine.....W. Fenuell
Turnstile registering device...J. E. Allison
Type-writer.....J. W. Paul
Type-writer attachment.....O. V. Schauer
Type-writing machine.....O. C. Kayle
Type-writing machine...A. G. F. Kurowski
Type-writing machine.....O. Woodward
Type-writing machine.....C. E. Smith
Type-writing mahine.....W. E. Barnard
Type-writing machine.....E. E. Barney
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Urinals, &c., Ventilating-fitting for.....J. M. Young
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Valve.....E. H. Barr et al
Valve for radiators, Air and water discharge.....F. W. Leuthesser
Valve-handle.....W. P. Marble
Valve, Water.....J. B. Anthony et al
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Valves, Operating means for gate.....D. Libby, Jr.
Vapor-burners, Automatic cut-off for.....S. Sternberg
Varnish.....L. H. Baekeland
Vaults, Construction of vestibules of armor-plate.....G. L. Damon
Vegetable-topper.....B. L. Ufford
Vehicle-brake.....W. J. Wilde
Vehicle-top rest.....P. Henry
Vending apparatus, Ticket.....G. F. Day
Vendiug-machine.....J. F. Moulton
Veuding machine, Stamp.....S. L. Long
Vending machine, Stamp and ticket.....E. E. Wigzell
Vessel, Marine.....C. L. Burger
Violin.....J. E. L. Winecoff
Vise.....A. W. Richards
Vise and support.....T. R. Higham et al
Voting-machiue locking mechanism.....C. C. Abbott
Wagon aud auto brake.....W. G. Aldridge
Wall-forming device.....W. A. Kurman
Warp-uniting mechanism.....H. A. Hansen et al
Warps, Spacing device for..J. G. Gourdeau
Washboard.....J. W. Gribbie
Washing-machiue.....D. Hawley
Water-closet cistern.....R. E. Crane
Water-current power system.....C. F. A. Röeli
Water-meters, Stuffiug-box for.....E. E. Gamon
Water-motor.....J. H. Hendrickson
Weather-strip.....J. P. Stahl
Web feeding and cutting attachment.....M. H. Maun et al
Web-feediug mechanism.....W. H. Mann
Wedge, Attaching.....J. L. Clarke
Weevil exterminator, Boll.....P. E. Hebert
Wells, Working-barrel for oil.....W. H. Walker et al
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Windmill-coupling, Safety-key.....C. E. Danker
Window construction.....J. Z. H. Baker
Window-lock.....A. Lewandowski
Window-lock.....W. R. Scurlock
Window-operating device.....S. E. Cibulas
Window-pane fastener..J. W. Van Newkirk
Window, Reversible.....N. Poulson
Window, Reversible.....G. F. Lindgren
Wire-drawing machiuery, Continuous.....H. Saville
Wire fabric.....H. E. White
Wire hoops, Lock-formiug device for.....J. Rolston
Wire-platiug machine.....G. L. Wallace
Wood-bending machine.....H. W. Bason
Wool-washer.....F. L. Furbush
Wrench.....J. B. Irwin
Wrench.....W. O. and J. C. Singer
Yarn-moistening apparatus.....P. Schilde

DESIGNS.

Automobile-body.....E. J. Gulich
Bedspread.....M. D'onofrio
Carpet.....J. H. Witzel
Carpet or rug.....H. Ulmer
Lamp-shade.....J. Kappler
Light shade, Artificial.....K. Booth
Range, Gas and coal.....G. A. Tinnerman
Reflector or similar article...O. H. Mygatt
Rug.....W. A. Spring
Rug.....W. G. Reith
Shaving-set holder.....A. Pujols
Spoon, fork, or similar article..H. Hillborn
Spoon, fork, or similar article..F. E. Pretat
Statuette.....E. T. Richards

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Aeroplaue.....L. R. Culver
Air-brake.....C. W. Frye
Air-brake-controlling means for locomotive-engines.....S. N. Stevens
Air-brake system.....A. J. Wisner
Air-compressor, Automatic.....J. Rogers
Air-compressor, Automatic....P. Bernstein
Alternator, Exciting.....C. H. Kicklighter
Amalgamating apparatus.....W. Montgomery et al
Amusement device.....F. Jackson
Anti-induction device.....M. M. Davis
Antiskidding device.....N. Barnett
Auger.....A. H. Howland
Automobile-fender.....D. J. Welton
Axle, Vehicle.....C. Criess
Bag-fastener.....H. Vanderwerp
Balancing device.....R. R. Reed
Balls, Making hollow metallic.....J. W. Schatz
Basket.....T. C. Nelson
Bearing-ball.....A. Riebe
Bearing-roller.....W. J. Brewer
Bed or seat, Spring.....I. E. Palmer
Bell, Electric signal.....H. W. Eden
Belt, Link.....W. C. Brisse
Bifurcating-machine.....R. L. Wilcox
Binder, Loose-leaf.....C. L. Bartling
Boat, Hydroplane.....W. M. and L. E. Meacham
Bobbins or spools, Holders for.....T. F. Roney
Boiler-tube cleaner.....E. I. K. Noyes
Boiler-tubes, Leak-stopper for..C. S. Clark
Bolster-spriug.....H. J. Noll
Boring-bar.....R. J. Mason
Bottle.....W. P. Bebler
Bottle and stopper therefor....W. Douglas
Bottle-cap.....A. Calleson
Bottle ends with tin-foil, Machine for closing.....T. K. Keith
Bottle stopper, Water.....M. C. Schweiuert et al
Bottles and vessels, Cap for....A. G. Kent
Bottling-machine.....S. Reinsberg
Box-blank-making machine....E. C. Staude
Brake-beam...2 pats...C. H. Williams, Jr.
Brake-beam.....S. U. Walck
Brooder.....H. A. Nourse
Brush holder, Paint.....C. H. Jorey
Brushes, Bristle-rim for rotary.....I. Abrahmsohn
Building blocks and wall.....H. Van Caeyseele
Butter-tester.....C. Wagner
Cabinet, Kitchen.....J. M. Bainer
Cabinet, Medicine.....C. Belfi
Cable-clip.....F. D. Ogden
Cable-hauling engine.....O. Potter
Camping apparatus.....G. E. Cronk
Can feeding and delivering mechanism.....J. W. White
Caudy-cooler.....G. F. Dickson
Car-brake-operating mechanism.....W. D. Brewster
Car, Convertible stock.....A. Westphal
Car-door.....H. A. Christy
Car-door.....A. R. Bulloch
Car-door.....C. Buss
Car-door supportiug and operating means, Flush.....D. F. Noh
Car doors, Weather and cinder strip for box.....J. M. Jordan
Car, Dumping railway.....J. V. Ericsou
Car-fender.....L. Fabian
Car-fender.....C. A. Bisbee
Car-replacer.....F. J. Wood
Car-roof framework.....E. Posson
Car safety-brake.....W. E. Nolan
Car-step, Extensiou....E. S. Mitchell et al
Car-ventilator.....E. Posson
Car-wheel and propelling parts coöperating therewith, Double safety.....L. Clark
Car-window.....L. J. Berg
Cars, Electric signaling device for motor..J. L. Palous
Cars, Life-guard for railway.....G. A. Parmenter
Cars, Means for locking drop-doors of dump.....R. G. Taylor
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Carbureter.....W. R. Park
Carriage, House-moviug.....D. Stout
Carriage-top.....G. W. Hedrick
Cartridge.....C. O. Person
Cash-register systeu.....P. G. Warnock
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Caster.....E. H. Humphrey
Cellar, Storm and refrigerator.....O. K. Harry
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Churu-dasher.....E. A. Franklin
Cigarette-tipping machine, Individual.....A. Boucher
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Clip-cap.....J. W. Kessel
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Cloth-holder.....B. A. Spinney
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Clothes-line clip.....W. M. Fridell
Clothes-rack.....M. Redlinger
Coal and ore crusher.....J. F. Sauermau
Coal-dust, coal-slack, aud the like, Semi-coking.....C. W. Beehler
Coat-facing.....E. Reisman
Coating metal objects.....B. Hemaun
Cock, Stop and waste.....W. H. Dehn
Coffee-roaster.....A. E. Tava
Coin-operated key-lock..C. E. Guthrie et al
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Collar, Coat.....M. Koppelmau
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Composition of matter..J. A. Schmitt et al
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Concentrator, Reciprocatiug mutiple-compartment.....G. A. Fowler
Concrete building.....W. S. Lauey
Concrete construction, Reinforced.....E. P. Wells
Concrete curbs or gutters, Form for laying.....M. S. Hotchkiss
Concrete fence, Reiuforced.....C. Mitchell
Concrete headstoue.....W. R. Thomas
Concrete-mold, Adjustable.....H. Pocock
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Concrete-sidewalk form....W. Ramey et al
Concrete structural work, Form for.....M. S. Hotchkiss
Concrete tie, Reiuforced.....C. R. Holdeu
Condenser and mold for carbon dioxid.....W. J. Flemming
Cooker, Fireless.....J. Winter
Cooling apparatus...G. W. and H. A. Wise
Core, Collapsible.....S. A. Wellman
Corn husking and shreddiug machines, Discharge-spout for.....A. Rosenthal
Cotton chopper or cultivator...M. C. Burch
Cotton-folder.....F. Phelps
Course-iudicator.....H. H. Nebanas
Crayon-holder.....G. A. Tucker
Cue-tipping machine.....G. Mahoney
Cuff-protector.....N. Cerri
Cultivator, Lister.....W. S. Graham
Culverts, Collapsible and adjustable mold for cement.....G. W. Fish
Currycomb attachment.....N. H. Burns
Curtain-pole.....B. F. Randolph
Curtain-roller.....E. Reukauf, Sr.
Cushion.....F. P. D'Arcy
Cutting-off tool.....L. J. Matzner
Cylinder-press.....E. P. Klug
Dado-machine.....P. L. Billingsley
Decoy-duck.....J. W. Reynolds
Dental engine, Electric.....J. V. Trenaman
Dental lavatory.....T. Dunbar
Dentimeter.....A. D. Cloud
Desk and seat, School.....A. R. Milner
Desk support, School.....W. A. Proctor
Die-carrier.....H. Zimmerman
Disk marker.....C. H. Myers
Display-box fronts, Fastener for.....A. F. Urban
Display device.....L. G. Quackenboss
Display-rack.....J. Wolkerstorfer
Display rack, Mattress.....L. Emerich
Display rack or stand.....J. D. Fassio
Distilling-column.....E. Bolton
Door and mechanism for operating the same, Automatic.....J. and J. Parkhill
Door for cold-storage rooms.....H. J. Flotron et al
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Door opening and closing device.....T. M. Blackwell
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Doors of hatches, Means for operating.....J. T. Taylor
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Draft mechanism.....L. J. Jackson
Drainage-plugs, Operating mechanism for..H. J. Genrink
Drawer-pull.....S. R. Cartledge
Drawing-press.....W. Klocke
Drill-socket.....F. Maier
Drumhead tightener.....E. M. Yates
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Ear-plug for bathers.....J. Lopizich
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Electric furnace.....E. H. Meyer et al
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Electric terminal clip.....W. Barey
Electrical conductor for illuminating purposes.....I. Ladoff
Electrical conductors, Device for preventing induction in.....M. M. Davis
Electrical distributing-board.....H. J. Blakeslee
Electrical distribution, System of.....J. L. Woodbridge
Electrical heater.....R. Lares
Electrical receptacle, Screw-plug.....F. J. Russell
Elevator safety device.....C. J. Brookins
Elevator system, Electrohydraulic.....E. M. Fraser
Embroidery-hoop.....N. C. Leonard
Engines, Current-controlling mechanism for internal-combustion....L. T. Rhoades
Engines, Frame construction for gas.....J. A. Carter
Engines, Speed regulator and timer for explosive.....J. F. Murphy
Excavating-shovel.....C. J. Reise
Exercising-machine, Electrical muscular...W. Harris
Extinguishing burning benzin, &c.....M. Breslauer
Fan, Mechanical.....L. Meszaros
Fan, Oscillating.....A. Rubin
Fastener.....J. W. McKitrick
Faucet.....W. H. Kilbourn
Faucet.....H. Mueller
Faucet.....J. Gielow
Feed-bag for horses.....C. W. Millsaps
Feeder, Poultry.....E. R. Donaldson
Fence clamp, Wire.....J. W. Davis
Fencing, Machine for reeliug aud cutting off wire.....J. M. Denning
Fertilizer-distributer..2 pats..C. C. Butler
Fertilizer-distributer.....C. H. Pelton
Filaments for incandescent lamps, Manufacturing.....J. W. Howell
Filter.....G. Moore
Filter.....F. D. Freeman
Filtering process.....G. Moore
Fire-alarm.....J. H. Hayes
Firearm.....C. A. Young
Fire-escape.....G. R. Witt
Fireproofing compound.....S. Goussell
Fishing-line reel and holder..W. F. Simous
Floor-joist and ceiling. Combinatiou.....A. F. Leiter
Floor-scraper.....W. F. Stern
Flower-pot and jacket for the same.....G. Hershkovitz
Flue-blower.....F. Shmonsky
Folding table.....S. Hyde
Follower-wheel, Composite....H. H. Tuuis
Forging-press.....T. F. Bailey
Frames, Attachment for testing or treating.....H. C. Hill
Freezing, Apparatus for concentrating solutions by.....E. Monti
Fryer, Doughnut.....B. W. Forgue
Funnel.....L. N. Ritten
Furnace.....L. B. Piper
Furnace.....H. A. MacClyment
Furnace.....W. G. Crosthwaite
Furnaces, Hot blast for boiler.....P. H. Bagley
Gage.....W. A. Lomax
Garment-closer.....O. Eisenkramer
Garment-supporter.....H. C. Hine
Gas-burner.....C. L. Bean
Gas-cleaner.....P. Mechan
Gas-generating apparatus.....H. H. Eason
Gas-producer...2 pats...G. C. Stoue et al
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Gearing.....G. B. Pilkington
Gearing.....S. Lippert
Gearing, Automobile transmission.....R. E. Wynn
Gearing, Lock for.....G. O. Leopold
Gearing, Power.....W. H. Hampton
Gearing, Reversing.....W. Struck
Gearing, Variable-speed.....F. Welker
Glove, Boxing.....S. Cline
Go-cart, Folding.....M. Folgeman et al
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Grass-catcher.....3 pats.....F. Wetteroth
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Grinder, Swinging.....M. F. Apgar
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Guns having different recoil, Retarding apparatus.....3 pats.....K. Haussner
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Hame-hook.....J. Q. Ormsby
Hames-fastening device.....J. W. Gonce
Hammer.....H. Malsch
Hammer, Electric.....C. C. Lutes
Hammer Pneumatic.....E. W. Raikes
Hammer, Power.....W. H. Welch
Hammer support, Pneumatic..H. M. Jacobs
Hammock-canopy, Folding..E. R. Norwood
Hammock, Framed or couch..I. E. Palmer
Hammocks, &c., Resilient bottom for couch.....2 pats.....I. E. Palmer

Handle-shaping machine.....C. Fletcher
Hanger-arm.....H. Laughlin
Harness-hanger.....J. W. Stake
Harness-spreader.....C. H. Anderson
Harrow.....C. G. Johnerson
Harvester.....G. A. Tuttle
Harvester, Cotton.....O. C. Houghton
Harvester, Grain.....A. Burger et al
Harvester, Pea.....G. E. Pritchard
Hat-fastener.....S. Raymond
Hat-fastener.....L. Metzdorf
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Heel, Spring.....E. A. C. Schoot
Hinge, Spring.....M. Merriman
Hog-catching machine.....G. W. Cox
Hoisting and conveying apparatus.....F. N. Wedge
Hoof-paring machine.....E. Cronin
Horse-overshoe.....B. Clow
Horseshoe-calk.....W. E. Abbott
Hose-bridge.....A. J. Neff
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Hosiery, Clamp for holding forms or stretchers for.....A. C. Beck
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Edging, Woven.....F. W. Oehrle
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Conveyers, Intake for pneumatic.....
.....J. W. East
Copper-ore concentrates preparatory for smeltiug, Agglomerating or briqueting...
.....T. Rouse
Core for molds, Expansible...P. C. Merillat
Corn-popper.....W. A. Stine et al
Corner-bead clip.....D. D. King
Corner beads or strips, Clip for.....
.....J. M. Shear
Counter-holder.....C. E. Raney
Conpling.....2 pats.....E. T. Greenfield
Crutch-tip.....E. H. Seibert
Cultivating implement.....F. P. Burdge
Cultivator.....W. L. Morford
Curtain fastener clamp.....M. L. Thomas
Curtain-fixture.....J. Schoepe
Cuspidor.....J. Orszag
Cuspidor.....L. Horvath
Cycle-pedal.....G. I. Francis
Dam and apparatus for constructing the same.....H. L. Cooper
Davit for ships' boats and similar purposes.....E. L. M. Sivard
Delivery mechanism.....W. Scott
Desiccating apparatus.....
.....J. H. and C. H. Campbell
Die.....H. M. Schwartz
Display-fixture.....W. E. Taylor
Display-folder.....M. H. Wilson
Distilling coal.....H. Koppers
Door closer and check.....C. B. Bishop
Door-handle, Safety.....D. Schuyler et al
Door-hanger.....H. E. Ballard
Door-lock.....J. W. Pheils
Door-opener, Electric.....J. Loch
Door-screen, Ventilating.....I. B. Seeley
Drawing-rack.....W. R. Willis, Jr.
Drawing-table, Adjustable.....A. Hoffman
Dredging-scoop.....T. S. Barwis
Drill-cuttings, Means for collecting.....
.....M. L. Sargent
Drinking-fountain.....B. Kaminsky
Drying-machine.....J. P. Marshall
Dust-collector.....G. A. Bauer
Dust-guard.....L. Y. Williams
Dust-reeeptacle.....J. S. Thurman
Dye and making same, Blue vat...R. Herz
Dyeing-machine.....J. T. Psarski
Eaves-trough, Self-cleaning..E. Kreutzberg
Electric and hand power elevator, Self-snstaining.....T. Wright
Electric conductor, Armored...P. Schröder
Electric cut-out.....T. E. Murray
Electric-generating system, Automatic.....
.....3 pats.....M. A. Newstetter
Electric-light hanger....O. M. White et al
Electrical distribution system.....
.....A. S. Hubbard
Electrical space communication.....
.....G. W. Pickard
Embossing-press.....O. McCann
Engine igniter, Gas.....G. Gray
Engine installation, Combined reciprocating and turbine.....J. Irving
Engine-stop, Automatic.....N. C. Locke
Engines, Device for controlling power of explosive.....J. H. Schoop
Engines, Timer for combustion..P. B. Fant
Engraving-machine.....R. Grieser
Envelop, Double.....A. E. Harker
Evaporation and apparatus therefor, Method of.....N. H. Hiller
Excavator, Power.....J. B. Webber, Jr.
Excelsior-machine.....E. D. Misner
Exerciser.....B. F. Bailey
Eyeglass-mounting.....F. A. Stevens
Eyelet-inserting machine...F. W. Luscomb
Fabric-feeding roll or head.....
.....W. B. Palmer
Fan, Electric.....R. P. Thompson
Fan, Table.....J. A. Fowler
Faucet.....J. J. Hannigan
Faucet, Measuring.....H. A. Nelson
Feeder.....J. W. Hildebrand
Feeding mechanism.....C. W. Graham
Feeding mechanism.....E. Stnck
Fence-machine.....H. Roberts
Fertilizers, litter, and other materials, Carrier for.....R. M. and A. J. Glor
File, Paper.....C. Spiro
Files and registers, Holding device for account.....L. E. Leonard
Filter.....G. Knock
Fire-curtain, Portable.....L. L. Goheen
Fire-escape.....F. Scherrer
Firearm, Automatic..2 pats..L. Schmeisser
Fish-hook.....E. L. Roberson
Flash-light apparatns.....W. T. Barnum
Fluid-motor.....W. J. Morrison
Fly-screen.....J. C. Marsh
Folding box.....J. A. Wagnitz
Foot-rest.....L. E. Fitzsimons
Fringe holder or rack.....L. McGrath
Frog.....G. W. Thompson
Fruit grading and cleaning device.....
.....H. K. Rowland et al
Fur-treating device.....M. Whitlatch
Furnace-charging apparatus, Blast.....
.....W. Kennedy
Fuse, Electric safety.....T. E. Murray
Gage.....F. Lohman
Game apparatus.....H. W. Westerberg
Game, Parlor base-ball....H. A. Comstock
Garbage-can, Automatic sanitary.....
.....J. W. Ross
Garbage-receptacle...J. P. and A. C. Urban
Garbage-wagon.....E. S. Door et al
Garment-clasp.....M. I. Hamburger
Garment-supporter.....C. A. McCarthy
Gas and electric cut-off, Time-controlled...
.....H. Niemann
Gas-burner, Inverted.....J. Lederer
Gas burner, Oil.....C. C. Lillibridge
Gas generator, Acetylene.....F. E. Stover
Gas generator, Acetylene...O. R. Moberley
Gas generator, Portable acetylene.....
.....O. A. Loveless
Gas-light, Inverted burner for incandescent.....A. H. Humphrey
Gas, Manufacture of.....A. Zindler
Gas-producer.....S. B. Sheldon
Gas-purifying apparatus.....E. Schmiedt
Gas-retorts, Charging upright.....
.....E. G. B. Körting
Gasket.....W. A. Schultheis
Gearing.....N. P. Fraser
Gearing, Transmission...W. W. Henderson
Glass articles, Machine for making hollow.
.....P. T. Sievert
Glass machine, Continuous-drawn sheet....
.....L. A. Thomburg
Glass-teeming apparatus..J. W. Cruikshank
Glove.....T. Ornas
Grain-loader.....S. L. Cornatzer
Grinding-machine.....O. Ashton
Grinding-machine.....E. F. Smith
Grinding-machine.....A. C. Warner
Grinding mowing-machine knives and the like. Grinding for use in...W. Rawlinsou
Hair-pin box.....B. E. Sawyer
Harvester.....S. Miller
Harvester, Potato.....C. W. Becker
Hasp-lock.....A. L. Jervey
Hay-loader.....J. Nelson
Hay-press.....J. S. Lallenr
Hay-rack.....C. Krogen
Headlight-support.....G. T. Williams et al
Heel-breasting machine.....J. Gouldbourn
Hemmer.....A. H. De Voe
Hinge, Shntter.....J. H. Dangherty
Hobby-horse and vehicle, Combined.....
.....F. W. Fuessel
Hoisting apparatus.....H. E. Bowcher
Honing and stropping machine.....
.....J. D. Tipton
Hoop-nailing horse, Lining.....H. Roberts
Hoop-nailing jig.....H. Roberts
Hoppers, Automatic stop and waste for outside.....H. C. Weitzel
Horseshoe-calks, Machine for making.....
.....R. W. Comstock, Jr.
Hose.....P. L. Wooster
Hose-supporter.....W. M. Titus et al
Hub, Wheel.....W. W. Cork
Humidifier.....J. Kelly
Hygrometer for regulating humidifying and heating systems.....S. W. Cramer et al
Ice-chopper.....A. Price
Ignition timer.....H. I. Broedling
Index, Card.....M. A. Brown
Indicating device.....H. G. Osburn
Indicator.....L. J. Rieckhoff
Internal-combustion engine..A. W. Nichols
Internal-combustion engine.....R. M. Roof
Invalid's hair.....R. M. Olmsted
Ironing-board.....S. T. Knapp
Knitting-machine needle.....G. C. Egly
Lamp, Alcohol.....J. W. Chapman et al
Lamp, Flash.....J. O. Ellingson et al
Lamp, Gas.....A. Rector
Lamp lock, Incandescent.....L. Davis
Lamp socket, Electric.....V. T. Bailey
Lamps, Adjustable stand for search.....
.....A. Krauth
Lamps, System of lighting by gas or vapor electric.....H. N. Potter
Latch and latch-connecting apparatns.....
.....H. G. Voight
Latch, Barn-door.....J. Dunn
Latch, Barn-door.....C. Harrison
Latch, Door.....F. E. Bessler
Laundry-iron, Electric...E. H. Richardson
Leveling mechanism for engineering and surveying instruments.....
.....J. L. Saegmuller et al
Life-sheet fender, Antomatic..M. L. Keizur
Lifting-jack.....J. H. Burkholder
Link and making same, Connecting.....
.....J. Merritt
Linotype-machine.....G. D. Hartley
Linotype-machine matrix...G. W. Grasnick
Liquid-meter.....2 pats.....J. W. Ledoux
Lignids and fluid substances, Machine for clarifying and filtering....T. B. Marshall
Lithophone-white and treating same.....
.....C. R. Stinau
Lock.....E. L. Teich
Lock.....H. G. Voight
Lock.....P. F. Augenbranm
Lock.....E. H. Jones
Lock indicator, Coin-controlled.....
.....W. H. Kluge
Locomotive-boiler, Articulated.....
.....H. S. Vincent
Looms, Compass-board for.....
.....K. and J. B. Engsberg
Looms, Thin-place-detecting means for.....
.....A. E. Rhoades
Lubricator.....J. H. Searle
Mail-delivering apparatus....J. H. Garman
Massage cup or tip.....J. B. Fey
Maganates, permanganates, halogens, and hydroxids, Producing.....F. J. Machan
Match-box.....C. Hiering et al
Match-box.....R. E. Lee
Mechanical movement.....J. D. Windsor
Metal flats and the like, Treating rolled.....
.....T. H. Daniels
Metal, Machine for attaching fabric to.....
.....L. W. Rhodes
Metal screen....H. W. and W. W. Watson
Milk-cooler and cream-receptacle.....
.....R. Anderson
Milk, Dehydrating.....T. L. White et al
Miners, System for ventilating and rendering first aid to entombed..R. C. Dawson
Mixing-machine.....G. Hoffmann
Moistening device.....W. J. Minkiewitz
Mop-wringer.....E. Charpentier
Motor and lazy-tongs elevator.....
.....C. A. Schwarz
Motors, Cut-off for fluid-pressure.....
.....J. H. Champ
Mower, Lawn.....L. L. Lovett
Muffler.....J. J. Radell
Music or the like, Apparatus for preparing matrix-sheets for the reproduction of written.....F. Dogilbert
Music-playing mechanisms, Controller mechanism for antomatic.....G. S. Williams
Music-rack and cane, Combined folding.....
.....L. D. Goughenour
Musical instrnment, Automatic.....
.....J. E. Hagey
Nest, Hen's.....A. Jessup
Nightgown.....J. R. Jones
Nozzle, Exhaust or suction.....A. T. Noe
Nut for spindles, Split adjusting.....
.....F. K. Rand
Nut, Spring.....W. C. Schoelkopf
Oil brazing-burner.....R. D. Conrad
Oil engine, Crude.....J. M. Primm
Oil-refining apparatus.....J. C. Fleming
Ore, Treating.....A. A. Lockwood et al
Oven, Portable baker's.....C. E. Sears
Oyster-opener.....A. F. W. Diamond
Package-holder.....P. R. Parmley
Package-lining.....F. S. Davis
Packeting-machine.....E. T. Pollard
Packing.....J. Crane
Packing, Hollow shaft.....H. Gray et al
Padlock.....C. D. Weeks
Padlock.....2 pats.....F. Soley
Paint.....2 pats.....O. Marchand
Paint or varnish remover.....C. Ellis
Panel-board.....L. C. Reed
Paper bag.....W. H. Stuart
Paper-bag holder.....P. Joiner
Paper box.....J. G. Reber
Paper-box-making appliance..G. N. Coryell
Paper or like material, Apparatus for separating sheets of.....F. W. Vickery
Paper receptacle.....J. N. Davis
Percolator, Coffee.....C. Fuller
Percolator-pot, Valved.....J. W. Chapman
Percussive apparatns, Automatic.....
.....W. Mauss
Phonographs, Sound-amplifier for.....
.....V. E. D'Urso
Photographic-print-drying apparatus.....
.....J. O. Ellingson
Piano touch-regulator.....
.....W. S. Thompson et al
Pianos and the like, Attachment for.....
.....A. D. Palmer
Pianoforte.....C. Vincent
Picture-films, Magazine for...G. W. Ryder
Picture-hanger.....J. A. Darden
Picture machines, Light-shield for moving.
.....J. J. Pink
Pictures in frames, Tool for nailing.....
.....R. B. Mimmack
Piling, Driving-cap for sheet.....
.....R. B. Woodworth
Pipe connection.....R. M. Corcoran
Pipe-joint connection, Steam..E. C. Colson
Pipe system, Hydraulic-power.....
.....C. A. Compton
Pipe-wrench.....A. Tréand
Pipes, Automatic connector for train.....
.....P. Beahm
Piston, Cylinder.....E. W. Phillips
Planetary transmission mechanism.....
.....C. F. W. Tabler
Plaster composition.....C. Ellis
Plow, Ditching.....D. Dahlstrom
Plow-slide.....G. L. Schroeder
Plunger-elevator.....F. C. Furlow
Plunger-equalizer.....A. M. Coyle
Pneumatic cleaner.....E. A. Laughlin
Pneumatic drill.....S. A. Titus
Poles, Apparatus for preserving wooden...
.....J. T. Logan
Portable bracket.....R. J. Birdwell
Portable elevator.....J. B. Ball
Potato cleaning and barreling device.....
.....A. E. Green et al
Poultry-killing apparatus.....
.....M. L. Shortridge
Presses and other machines, Safety appliance for.....J. T. Ronan
Presses, Method of and apparatus for running coagulated lumps or the like from the dies of extrusion.....E. Lüttmann
Presser-foot.....A. Grieb
Pressure-generator.....T. Wright
Printing and cutting machine...L. G. Buck
Printing-press.....A. P. Harland
Printing-press ink-supplying means.....
.....A. P. Harland
Printing-press inking apparatus.....
.....M. A. Droitcour
Printing-presses, Throw-off mechanism for.
.....M. A. Droitcour
Printiug purposes, Cliche and other surface for.....M. Sandmann
Profiling-machine.....M. F. Smith
Pulley.....H. J. Gilbert
Pulley.....W. H. F. Raifsnyder
Pulley, Rope.....G. G. Donaldson
Pulp fibers from pigments, size, filler, and other impurities, Apparatns for separating.....B. W. Petsche
Pulp fibers from pigments, size, filling, and other impurities, Separating.....
.....B. W. Petsche
Pulverizing-mill.....A. J. Sackett
Pump.....E. Garstenberg

Pump, Oil....E. Woerner
Pump-valve....C. Dickinson
Pumping apparatus, Well....C. M. Heeter
Pnuch, Plate....A. Koch
Puzzle....D. E. Smith
Radiator foot-rail....A. J. Beaton
Rail-brace....A. O. Buckius, Jr.
Rail-joint....C. F. Wolf
Rail-joint....S. Shuller
Rail-spike....M. Topliff
Railway-frog....J. E. Lewis
Railway-spike....D. M. Lipscomb
Railway-tie....D. R. Will
Railway-tie....F. E. Davidson
Railway tie-plate....A. Morrison
Razor-blade holder, Safety....G. M. Atkins
Receptacle....A. H. S. Swan
Reel-holder....M. McDongall
Reel-holder....2 pats....J. P. Weaver
Refrigerator....T. Henderson
Refrigerator....F. E. Ranney
Refrigerator-car....G. C. Bohn
Regenerative reversing-furnace....L. L. Knox
Regulating and reversing apparatus....H. Kopper
Riveting-machine, Hydraulic....W. H. Wood
Roads, Making....L. S. Van Westrum
Rock-drill....H. A. Dalmus
Rock-drill, Electric....O. S. Proctor
Rock-drill spraying device...W. J. Barnett
Roll-making machine....H. F. W. Ilneg
Roller-bearing wheel....W. J. Brewer
Roller, bumper, &c....H. F. Pendleton
Rolling-mill....F. H. Daniels
Roofing-plate....E. K. Day et al
Rotary engine....H. M. Van Alstyne et al
Rubber, Vulcanizing....H. F. Pendleton
Rudder....S. B. McNeely
Ruffling and stitching machine....A. H. De Voe
Ruler and blotter-holder, Combination....W. E. Jacksou
Running-gear, Swiveled....H. Higgin
Safety-burner....J. W. Dearing
Sash lock, Window....A. C. J. Roy
Saw-handle....J. Sells
Saw-set....W. H. Swainton
Saw set, Crosscut....F. W. P. Rajala
Sawing-machiue, Portable....J. H. Longstreet
Scaffold, Portable....F. Nowodworski
Scale, Weighing....A. W. Epright
Screen....H. W. and W. W. Watson
Screen....C. E. and W. C. Marsh
Screw-joint outlet, Lead-calked....J. Douglas
Seal-lock....A. A. de A. de Castro
Sealing machine for pasteboard cartons, Bottom-flap....F. B. Martin
Sealing machine, Tube....T. A. Edison
Sealing means for registering devices....F. J. Frederick
Separating device....C. P. Bossart
Sewing-machine....J. Danenmark
Sewing-machine, Hemstitch....M. Hemleb
Sewing machine, Shoe....F. J. Nash
Sewing machine, Shoe....E. E. Bean
Sewing-table for bookbinders....G. M. Gaither
Shade adjuster, Window....L. P. Harris
Shade ornament and weight, Combined window....M. A. Sapp
Shaft holder, Vehicle....O. B. Oller et al
Sharpener, Scraper....J. E. Hillstrom
Sharpening, Clamping device for holding cutter-bars for....A. B. Donaldson
Sheet-metal box....M. Kamenstein
Shield, Chafing....B. Hall
Ship and ship's hatch....J. R. Oldham
Shoe....W. Beck
Shoe-calk attachment....A. Roth, Jr.
Shutter-fastener....H. Zimmerman
Shuttle....J. G. Sergeson
Shuttle-holder....T. Mooney
Sign....F. S. Schaefer et al
Sign, Illuminated....R. F. Venner
Signaling and fire-alarm system, Watchman's....G. M. Willis
Signaling by electromagnetic waves....R. A. Fessenden
Signaling system, Automatic electrical....H. M. Eldred
Signaling system, Selective....M. W. Zabel
Siphon....C. F. Hunkett
Skeleton post or tower....E. E. Newman
Slicer, Meat....A. W. Johnson
Slicing mechanism....J. F. Kohler
Smoke-bell support....F. H. Mechling
Sod-line-cutting device....A. E. Heyman
Soldering-iron....L. S. Frost
Sound recording and reproducing machine..C. E. West, Jr.
Spanner-wrench....G. Amborn
Speed device, Variable....B. D. Stevens
Spinning or twisting machiues, Thread-board for....E. Writtum
Spoke-socket....C. E. Brown
Spool....J. D. Chaffee
Spraying apparatus....W. B. Inglis
Square holes, Device for forming....C. A. Brown
Stanchion, Cattle....A. H. Race
Station-indicator....A. G. Anderson
Station-indicator and advertising device...C. H. Hopkins
Steam-boiler....J. M. Lord et al
Stencil-cutting machine....A. Langsdou
Storage-case and exhibition device, Combined....E. Steeb
Stove-grate....C. Fish et al
Stove, Reflector....J. T. Reznor
Strainer, Tea and coffee....A. L. Lindroth
Strainer, Tea and coffee....C. D. Johnson
Swinging chair, Child's....H. C. Benner
Switch attachment, Electric....H. C. Robinson
Switch-block....T. E. Murray
Switch device, Safety....J. A. McCain
Switch receptacle, Electrical....J. G. Peterson
Switching device....O. M. Leich et al
Table and chair, Combined....D. E. Ballam
Table attachment for furniture....A. Hoffman
Tachometer, Magnetic....J. K. Stewart
Talking-machine sound-box....E. H. Mobley
Tap-holder, Safety....L. J. Cudahy
Target-trap....H. C. Lord
Teeter and merry-go-round....M. Miller
Telephone....W. H. Thompson
Telephone and telegraph system, Composite....O. T. Lademann
Telephone apparatus....D. H. Wilson
Telephone exchange system..E. E. Clement
Telephone-receiver....H. R. Stuart et al
Telephonic apparatus....T. C. Rafferty
Telephonic apparatus, Long-distance....V. Tardieu
Telescope, Double....A. Schachenmayer
Tie-plate....W. McKee
Tie-plug machine....H. G. Smart
Tile, Hollow....J. M. Carmean
Tiles of the faience kind, Manufacturing wall-facing....G. Delbrouck
Time ascertaining and recording book or device....S. E. Thompsou
Time-recorder....J. and A. Dey
Tire for vehicle-wheels, Pneumatic....A. Wolber
Tires and fellies, Boring and bolt-iuserting machine for....E. Funk
Tires, External guard for pneumatic....J. L. La Driere
Tool, Pneumatic....F. M. Iler
Tooth-regulator....J. Steinbrugge
Toy cannon....J. A. Dainty
Traction-machine....G. W. McGill
Transit and level, Combined....A. Frese
Transmission system....O. T. Lademan
Transportation system....W. C. Carr
Trap....H. G. R. Benuett
Tray and rack support, Foldable....L. L. Morse
Trolley-wheel....B. B. Gibbs
Trousers-hanger....P. L. L. Yorgensen
Truck or vehicle, Dumpiug....W. H. Hunt
Trunk-fastener....C. Dittmar
Tubing and casing spear....C. M. Heeter
Tug, Hame....F. H. Hewlett
Tunneling-machine....W. Wittich
Turbine, Steam....J. Melville
Turpentine-cup....E. A. McKoy
Tweezers....M. Eugelsman
Twine-finishing machine....H. Cardwell
Type-carrier....W. Chipperfield
Type-cleaner....A. C. Bishop
Type-writer attachment....L. E. Baltzley
Type-writer auxiliary ribbon....W. G. Latimer
Type-writer carriage-return mechanism....W. Bloomfield
Type-writing and similar machiues, Finger-key for....E. D. Conklin
Type-writing machine....G. F. Ballou
Type-writing machine....A. J. Briggs et al
Type-writing machine....E. B. Hess
Type-writing machine....C. P. Mosher
Type-writing machine....J. C. McLaughlin
Type-writing machine....F. Alexander
Type-writing machine....W. J. Barron
Type-writing machine....C. L. Fortier
Type-writing machine....F. Alexander
Umbrella and hat holder....E. De Vricze
Umbrella, Folding....W. L. Mills et al
Uncoupling device....J. B. Moyet et al
Universal joint....L. Schwitzer
Unrolling device....S. W. Wardwell et al
Upper-hanger....D. T. French
Vacuum-cleaner....R. B. Hutchinson
Vacuum-cleaner....G. S. Bennett
Vacuum-cleaner, Hand....J. S. Thurman
Vacuum-cleaning apparatus, Single-tank...J. S. Thurman
Vacuum cleaning systems, Suction-head for....J. S. Thurman
Vacuum-tubes, Fixture and reflector for....D. M. Moore
Valve....T. Galvin
Valve....B. A. Geurink
Valve....S. Davis
Valve....H. C. Kinuisou
Valve and waste-cock, Combined safety....J. P. Fell
Valve, Automatic shut-off....W. Brennan
Valve, Flap check....G. Woodall
Valve, Flush....P. Grabler
Valve, Flushing....A. N. Pasman
Valve, Hot-water-radiator....J. P. Murphy
Valve, Reducing....A. W. Cash
Valve, Signal....F. E. Kimmell
Valve thread-preserver, Oil....J. B. Oeink
Valves, Slow-down attachment for hydraulic....F. Hymans
Vapor-burner....E. B. Raymond
Vapor devices, Starter and circuit for....S. E. Flichtuer
Vapor from aqueous liquids, Dissociating and removing....W. T. Hoofnagle
Vault and strong-room door..W. E. Arnold
Vehicle-brake....S. McGaw
Vehicle-wheel....J. H. Watters
Vehicles, Fluid-equalizing support for....H. Van Dyken
Vending machines, Delivery mechanism for pencil....A. Wagniere
Veneer barrel or package machine....H. Roberts
Ventilating-register....J. W. Pheils
Vine-separator....C. Barnum
Vise, Plumber's....F. Carle
Wagon, Automobile....2 pats....M. V. B. Ethridge
Wagon-brake....H. C. Murdock
Wagon, Dumping....E. G. Hartle
Wall-seat wall-bed....A. L. Haley
Warship....N. Soliani
Washing-machine....J. W. Walter
Washing-machine cylinder..T. J. Calloway
Water-meter....M. Maffitt et al
Water-motor....W. G. Stowell
Water-tube boiler....C. Mahlke
Weather-strip....V. E. Tischler
Weighing apparatus, Car....A. W. Epright
Well-screen....S. N. Hall
Well-tubing, Rotary for....S. N. Hall
Wells, treating oil....A. P. Elten
Wheel-scraper dumper....T. G. Jacklin
Wheel-securing means....R. E. Bergmann
Whip-socket....C. A. Keller
Window frame and sash....O. V. Nystrom
Window-screen....B. Worthington
Window-tent....J. G. Allen
Wire-stretcher....J. H. Forshee
Wrapping-machine....R. Britton
Wrench....R. Miller, Jr.
Wrench....J. R. Long
Wrench....E. H. Gotshall
Wrench....A. O. Semsmon
Wrench....G. Bryar
Writing-machine attachment..L. D. Camps

DESIGNS.

Badge or similar article....J. Adler
Bottle....B. Hoff
Chandelier-trimming....H. Gothberg
Clock-case....J. M. Pease
Coffins or caskets, Lug for....P. R. Zinser
Indicator-dial....R. L. Williams
Raliug-block....D. B. Luten
Shade, Artificial-light....W. W. Gleason
Shade, Artificial-light....P. Schilling
Shade or reflector or similar article....O. A. Mygatt
Spoons, forks, or similar articles, Handle for....G. F. Kolb
Vehicles, Radiator-cap for motor....L. C. Phipps, Jr.
Wafer, Paper-seal....E. Tauuton

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MECHANICAL PATENTS.

Advertising apparatus.2 pats..A. S. Spiegel
Advertising device....H. W. Cadwell
Aerial uavigation, Device for....H. C. Schanze, Sr.
Air-brake pipe-coupling....L. A. Peterson
Air-compressor....A. T. Newell
Amusement device....J. J. Treanor
Annunciator....C. Miller
Antifreezing-closet....N. Peterson
Anvils, Calk-weldiug attachmeut for....A. F. Beck
Automatic lubricator....F. F. Ellis
Automobile-wheel....W. Tischbein
Automobile wind-shield....J. N. Haus
Automobiles, Spare-tireholder for....J. E. Fahlstrom
Axle and bearing for vehicles....H. Houldsworth
Bag-cleaning machine....N. E. Gardner
Bait, Fish....F. A. Alger
Baker, Fireless....A. T. Thoits et al
Baling-press....J. Barens
Bank, Savings....R. W. Crary
Barrell, Cyanid....B. O. Webb
Barrel-head fastener....J. N. Clouse
Barrette....A. Burke
Barrette, Puff-forming....M. B. Nathanson
Basket closure, Fishing or other....R. E. Eaton
Basket, Work....S. Krohnengold et al
Battery plates, Preparation of secondary...F. A. R. Wright
Beam structure, Composite..W. P. Francis
Bearing, Antifriction....M. Gohlke et al
Bearing, Combined roll aud ball....C. S. Lockwood
Bearing with angular rolls, Roller....C. S. Lockwood
Bearings, Separator for antifriction....F. E. Bright
Bed, Sofa....S. Karpen
Beehive-entrance guard and swarm-controller....G. T. Whitten
Bell-support....P. C. Arnold
Bellows-actuatiug mechanism....R. Lasrich
Bicycle, Marine....C. F. and R. C. Kranse
Billiard-table registering device....G. C. Pollay
Binder, Loose-leaf....R. H. Barlow et al
Blank-trimming machine....A. W. Ainsworth et al
Boiler regulator and feeder, Steam....V. Garbarino
Boiler-tube spreader...2 pats...J. J. Maher
Bolster, Body....O. S. Pulliam
Bolt-operating-mechanism controlliug device....G. L. Damon
Bond-tester....J. B. West
Book, Check....M. T. Levey
Bookbinding....E. J. Sullivan
Boring-machine....E. Prescott
Bottle and nipple, Nursing....D. B. Smith
Bottle-cap-making machine..R. B. Cochran
Bottle-closure....F. A. Anthony et al
Bottle-holder....A. H. Allen
Bottle, Milk-testing....A. Jensen
Bottle, Non-refillable....M. Perez
Bottle, Water....T. G. Strater
Bottles, Safety device for antirefillable....J. B. Arsac
Bottling device....R. L. Hepler
Box....J. S. Lauterbach
Box-fastener....E. P. Warfield
Boxes, Blank for covering shouldered-neck...J. P. Markert
Bracket....C. F. Lauu
Brake-beam....C. H. Williams, Jr.
Brake-beam....P. B. Harrison
Brick, Burning....P. Q. Bennett et al
Brickmaking-machine....G. W. Taylor
Bread-wrapping machine....I. F. Peck
Brush....C. Miller
Brush-cutting machine....G. E. Roose
Brush-holder....R. Siegfried
Bucket, Fruit....T. Meixner
Buckle....P. R. Tuttle
Buggy-evener....E. A. Kast
Bung....J. T. Delaney
Burner....J. J. Riehl
Burner....A. C. Butler
Button, Collar....F. M. and N. Yonkman
Calculating-machine....H. Goldman
Calculating-machine....E. Jahnz
Calculating-machine reversing mechanism...R. Rein
Can-carrier....F. L. Taulman
Can-end-flanging and head-seaming apparatus....A. Johnson
Can-filler....W. F. Thomas
Can handle, Oil....J. Boothby et al
Candelabrum....C. Yoos
Car-brass mold....G. L. Hoffer
Car-coupling....J. Kelso
Car-door....G. A. Carlson
Car, Dump....J. O. Neikirk
Car, Dump....H. S. Hart
Car, Passenger....H. C. Heffner
Car, Street....W. Lumley
Car structure....A. E. Smith
Car-underframe....A. Becker
Cars, Antitelescoping eoustruetion for....T. Dunbar
Cars, Beamless brake mechanism for railway....W. P. Bettendorf
Cars, Curtain for vestibule...E. C. Holmes
Cars, Trap-door for vestibule....W. F. Kiesel, Jr
Carburetor....W. H. C. Higgins, Jr
Carbureter, Floatless....M. C. Bright
Card-cutting machine....W. Greeven
Card, Playing or game....W. W. Russell
Cartridge-shell....A. Loeb
Caster, Ball....D. B. Hussey
Cattle-guard....E. J. Thomas
Chair and couch, Convertible....H. Tiedemann et al
Chalk-line reel....R. L. Pickering
Charging apparatus....F. H. Daniels
Cheese-cover....E. D. Hall
China-cabinet and table, Combined....J. H. Bennett
Churn....F. O. Homme et al
Churn....W. F. Smithdeal
Clinometer, Line....E. H. Holden
Clock, Alarm....W. E. Porter
Cloth-cutter....M. Langman
Clover-huller....J. W. Clutter
Coating-machine....J. R. Pulsifer
Cock, Stop....Z. L. Sault
Coffee-chaff extractor....E. T. Wear
Coffee-cleaning apparatus....W. D. Balcom
Coke-oven....W. J. Kearns
Collar, Coat....C. Kaufman
Combs, &c., Apparatus for making....J. Wileox
Compressor....G. D. Warreu
Computing device....W. J. Rainey
Computing-machine...2 pats....J. M. Daly
Concentrator....P. McFarlane
Concrete roadway, Oiled....E. M. Chadbourne
Condiment-holder....G. B. Clemmer
Conveyer....C. D. Seeberger
Conveyers, Flight attachment for....A. J. Frase
Cooker....G. G. Fox
Cooking utensils, Device for greasing....F. R. Bradbury
Coop or crate....2 pats....O. J. La Bauve
Copying-machine....M. Drachmann
Corn-crib....R. D. Ralston
Corset....H. W. Gilbert et al
Coupling....F. C. Bowles
Cover-fastener....F. W. Garrett
Crane....H. W. Jacobs
Crib, Rocking....W. B. Walton et al
Crown-block....F. S. Barkclew
Crushing-roll....R. Bernhard
Cuffs and the like, Machine for folding blanks for....W. L. Dixon
Current motor, Alternating....2 pats....V. A. Fynn
Current motor and generator, Single-phase alternate....V. A. Fynn
Curve-scriber....O. A. Zeier
Cuspidor-cleaner....E. Huddart
Cutting-machine guard....S. B. Blanchard et al
Damper control, Automatic....H. Peterson
Dental attachment....W. J. Brady
Denture....E. B. Crane
Depositing-box and time-stamp....C. A. Nauck
Diaper-cleaner....G. M. Scott
Dies, Machine for engraving or sinking....J. F. Keller et al
Display-card....T. E. Wiederseim, Jr
Display device....A. S. Spiegel
Door, Screen....B. C. Rockwell
Double-faeer....F. Busald
Draft mechanism, Six-horse...H. Messman
Drill-mounting....C. C. Hansen
Driving mechanism....C. W. Willette
Driving mechanism....W. A. McKinney
Dumb-waiter....W. B. Updegraff
Dust-pan....F. Hubert
Dust-remover, Vacuum....J. G. Meyer
Dye, Orange vat....J. Deinet
Dye, Vat....2 pats....J. Dienet
Dye, Vat....P. Thomaschewski
Dye, Vat....J. Deinet
Egg-batter, Desiccating....J. M. Hussey
Egg-preserving device....D. A. Callaway
Egg-separator....M. Burrmeister
Elastic cellular filling material, Apparatus for use in the manufacture of....R. J. Caldwell et al
Electric arc or resistance and induction furnace, Combined....J. H. Reid
Electric drill, Portable..W. C. Hafemeister
Electric-fixture fitting....E. C. Ruth
Electric furnace....H. W. Hixon
Electric machine, Dynamo....C. A. Psilander et al
Electric machine, Dynamo...E. M. Tingley
Electric machine, Dynamo....J. E. Webster et al
Electric machine, Dynamo...F. B. Howell
Electric machines, Brush-holder for dynamo....E. M. Tingley
Electric machines, Brush-holder for dynamo....C. B. Auel
Electric machines, Coil-shield for dynamo..J. E. Webster et al
Electric machines, Means for eooling dynamo....2 pats....H. Roos
Electric switch....J. H. Clamp et al
Electrode for arc-lamps....G. M. Dyott
Electrotype-plates, Bending..P. M. Furlong
Electrotype-plates, Plate-holder for use in bending....P. M. Furlong
Elevating apparatus, Box and package....A. O. Brigance
Elevator control device, Automatic....L. J. Milke
Elevator interlocking safety device....R. P. Lumley et al
Elevator safety attachment....P. Walker
Elevator safety device....S. S. Stolp
Ellipsograph....J. R. Shea

Embroidery-ring.....G. P. Jameson
Emery-wheel hood.....G. W. Furrow
Engine power-gage, Steam.....G. Cipollina
Engine-starter.....E. N. Rittase
Engine starter, Gas.....G. C. Hicks, Jr
Engine timer, Internal-combustion.....J. A. Schneider
Envelop.....N. Toomer
Envelop-machines, Discharging device for..F. L. Schmidt
Eyeglass-mounting.....J. T. Laughlin
Fan and sunshade, Combined.....R. Greenfield
Fan, Rotary.....J. R. Robinson
Fastener-strips, Machine for making corrugated and saw-toothed metal.....E. S. Norton
Feed-bag.....G. B. F. Emerick
Feed-grinder.....S. K. Dennis et al
Fiber, Making a resilient.....S. A. Flower
Filling-machine.....F. C. H. Strasburger
Filling-machine.....C. L. Bastian
Filter.....T. F. Seitz
Filter and controlling-valve therefor.....P. S. Ward
Filter, Water.....M. Gessler
Finishing process.....R. T. Todd et al
Fire-engine, Chemical.....E. M. E. Hansen
Fire-hose, Antidrip device for.....H. F. Beers et al
Firearm-silencer.....R. A. Moore
Firearms, Firing mechanism for..A. Müller
Firearms, Single-trigger mechanism for.....W. H. Price
Flask.....W. C. Bogenschutz
Floor and ceiling plate.....H. J. Robinson
Flue-blower.....G. W. Bernaner
Flue-cleaner.....V. G. Becker
Flue-stopper.....G. O. Terry
Fluid regulator.....G. J. Leber
Flushing apparatus.....P. S. Millice
Flushing device.....F. W. Fassett et al
Food products, Container for.....L. H. Baekeland
Foot-rest.....C. E. Clark
Friction drive mechanism.....O. P. Grau
Frogless switch.....J. J. Newman
Fuel-briquet.....D. C. McCan
Fuel-economizer.....E. R. Phillips
Fuel-press.....D. C. McCan
Furnace.....J. W. Hays
Furnace-grate.....T. Dawson
Furnace, Crown or eover of electric.....P. Girod
Fuse.....A. E. Porter
Fuses, Tester for electric blasting.....F. Beattie
Game-blocks, Combination.....C. H. Rieth
Garbage and recovery of by-products, Destruction of.....W. M. Cross
Garment-presser.....J. Bischof
Garment-receptacle.....G. H. Wheary
Garment-supporter.....G. H. Snow
Gas-engine.....L. C. Vanderlip
Gas-fire-lighting device.....C. C. Vail
Gas-fixture, Automatic.....E. M. Johnson
Gas, Method of and apparatus for producing.....E. E. Slick
Gas-producer.....E. E. Slick
Gas-producers, Automatic water-regulator for.....J. P. Nawn
Gases from their mixtures, Separation of..R. J. Lévy et al
Gasolene-engine.....J. C. Bonnett
Glove-fasteners, Machine for attaching.....2 pats.....J. H. Goss et al
Golf-club.....D. Myles
Grader.....L. N. Morscher
Grader, Road.....H. Sunderman
Gradometer.....E. A. Hammett et al
Grain-saving deviee.....J. Marshall
Grain-separator.....H. S. Adams
Grain-separator for attachment to threshing-maehines.....W. J. McAdams
Grain spreader and feeder.....A. Clark
Grapple.....P. L. Peterson
Grease-eup.....K. O. and A. E. Dufva
Greenhouse or the like, Portable.....E. C. Kline
Grinding cutlery-blades and the like, Machine for.....T. R. Moore
Grinding-tool.....M. F. Parsons
Gun, Triek water.....E. De Moulin
Hammer, Revolving.....W. Boyd
Hammers, Nail-holder for.....H. Sehneider
Harvesting machine, Beet.....J. E. Nix
Hat-guard.....R. S. Wiesenfeld
Hat-remodeling tool.....I. C. Reily
Heating applianee.....2 pats.....C. C. Spengler et al
Heating system.....F. C. Goff
Heating system, Hot-water....H. L. Bruce
High chair, Adjustable.....H. P. Hansen
Hinge.....E. F. Hulhert
Hinge, Door.....F. Schwarz
Hoisting-bucket.....V. H. Crites
Hoops, bands, stripes, or bars to rolls, Adjustable meehanism for feeding metal...F. F. Gregg
Horn and resonator therefor, Diaphragm-actuated.....M. R. Hutchison
Horn, &c., Signaling.....M. R. Hutchison
Horseshoe.....J. B. Locker
Horsehoof applianee.....C. E. Fear
Hydraulic press.....H. J. Bellamy
Ice-chipping machine.....W. Z. and F. P. Dalgety
Iee-saw.....J. H. Mapes
Iee-serving deviee.....G. F. Savoy
Incubator.....L. N. Porter
Inseam-trimming machine...A. E. Johnson
Insulating compound, Refractory waterproof.....W. H. Wright et al
Insulator for railway-trucks...J. M. Wood
Internal-combustion engine..J. H. Hopkins
Internal-combustion engine, Two-eycle.....E. A. Meyer
Iron ores, Cleaning.....E. F. Goltra
Iron tank, Galvanized.....G. A. and A. F. Trachte
Jail-cell walls, Interchangeable bottom for.....D. F. Youngblood
Jar-cap leveler.....W. H. Honiss
Jar-top.....C. R. Keeran
Jaw-trap.....J. E. Brock
Journal-box.....3 pats.....G. A. Woodman
Kinetoscope.....L. Hetz
Knitting-machine.....G. T. Nicholls
Knob-spindle fastener.....W. Curlett
Knockdown box.....A. N. Bender
Lamp.....C. A. McCune
Lamp-burner, Wick-stop...E. S. Sanderson
Lamp-chimney.....P. Tennant
Lamp-chimuey holder.....G. E. Alphin
Lamp, Gas.....R. M. Dixon
Lamp sockets, Casing for eleetric.....A. L. Jacobs
Lamps on vehicles, Means for automatically controlling.....R. G. Stanley
Lamps, Shock-absorber for tungsten.....F. Schwartz et al
Last.....H. Keil
Last, Block.....E. L. Goding
Lawn-trimmer.....O. H. Watkins
Leather eup.....I. H. Venn
Letter-sheet and envelop, Combined.....E. Maren-Covick
Level.....J. Schmid
Lewis.....L. Ciardelli
Lifting-jack.....A. Halvorson
Light-fixture, Extension.....C. M. Pitel
Lime, Hydrating.....W. H. Kemler
Linen-smoother.....C. Ellis
Linotype-machine.....J. B. Allen
Liquid-cooler.....J. Allau
Liquid-separators, Liner for centrifugal.....C. A. F. Ramström
Lithographie-printing plates, Producing...W. Gerh
Loader, Portable.....M. E. Mogg et al
Lock.....J. H. Wilkins
Lock-alarm.....J. F. Howard
Locking device for rotative parts.....F. A. Schluns
Locomotive ash-pan.....A. J. Brodhead
Locomotive blower and air-pump-exhaust pipe.....F. L. Holcomb
Locomotive, Rack-rail.....C. A. Pratt
Loom, Filling-replenishing.....J. Northrop
Loom picker-stick check.....S. D. Eubanks
Loom shedding mechanism.....P. Labonte
Loom-temple.....J. Northrop
Looms, Lay for narrow-ware.....E. R. Holmes
Looms, Thin-place-detecting mechanism for.....S. D. Eubanks
Mail-bag catcher and delivery apparatus...C. B. Buss
Mail-collecting apparatus...J. A. Steinmetz
Mailing-tube.....H. L. Gray
Main and pipe cleaner..H. A. Greenau et al
Manure-loader.....J. Nold
Mash and the like from noxions odors and flavors, Freeing fermented...A. P. Stitzel
Masts, poles, or the like, Protecting means for.....O. F. Weinlig
Match box and holder.....F. O. Kullander
Measuring and dispensing eau or tank.....A. G. Sherman
Measuring instrument, Electrical.....P. MacGahan
Metal-bending machine....H. E. Parmenter
Metal-scraping machine.....P. R. Bissell
Metal structure.....P. M. Wege
Metals in solution, Separating.....W. S. Gates et al
Metallic screen.....H. A. Way
Metallic tie.....E. Cronin
Meter-register.....L. H. Nash
Methane or mixtures of methane and hydrogen, Manufacturing....P. Sabatier
Milk-can and making the same.....R. Bray
Milk-can, top-rim, eover, and lock.....R. Belitz
Milk-condenser.....W. and W. Dehetre
Milling-machine.....R. K. Le Blond et al
Mine skips and cages, Safety mechanism for.....H. E. Hyde
Miter-block.....E. C. Kellogg
Mixing machinery.....G. H. Petri
Mold-sander.....D. P. Sanders
Molding apparatus.....E. E. Carter
Molding-machine.....W. O'Connor
Mop-head.....W. H. Zachry
Motor fluid, Apparatus for producing a....H. Maxim
Mower, Lawn.....W. M. Potter
Mower, Lawn.....J. H. Smith
Mower, Lawn.....G. A. Culver
Muffler.....W. O. Thomas
Muffler.....E. D. Sizer
Net, Fish and fruit.....J. F. Fromm
Nut cracker, Edible.....H. I. Weed
Oil-burner.....H. M. Daggett
Oil burner, Crude.....L. Fetty
Oil burner, Crude.....C. A. Japhet
Ore products, &c., Means for handling and distributing dewatered crushed.....H. C. Behr
Ores and carboniferous earths, Treating...A. A. Lockwood
Pad-holder.....L. A. Lahey
Padlock.....A. M. H. De Bruycker
Pail-holder.....J. Weinberg
Pallet setting and adjusting tool.....L. E. Garnett
Paper bag or sack.....T. E. Chapman
Paper bags and for packeting tobacco and other materials, Machine for making.....E. L. Bracy
Paper-plaiting apparatus.....C. R. Heiser
Partition and the like, Office.....H. Klein
Pasteurizer.....H. Christensen
Pen, Self-filling fountain.....B. Grieshaber
Pepper-boxes and the like, Top for.....E. Cruikshank et al
Phase-splitter.....H. H. Cutler
Phonograph.....R. Berndt
Phonograph-record mold.....E. L. Aiken
Photographic purposes, Sensitized surface or film for.....W. H. Caldwell
Photographs, engravings, or the like in a dry condition, Mounting...J. Neubronner
Pie-crust-forming maehine.....O. Colborne
Pie-filling machine.....O. Colborne
Pigment with basis of ealeium cyanamid and making same.....R. Fulloni
Piling, Metal sheet.....F. N. Kneas
Plant-thinning apparatus.....E. F. Webb
Planter, Corn.....H. F. Lotz
Planting machine, Potato.....T. J. Kelly
Plaster-board.....E. Bye et al
Platter, Lunch.....L. B. Kauffmann
Player, Automatic.....J. A. Weser
Plow.....B. M. Edelen, Jr
Plow, Gang.....D. J. Elliott
Plowshare for grubbing-plows, &c.....C. D. Jauer
Pneumatic cleaner.....A. Lotz
Poke, Animal.....W. Brewer
Post-hole digger.....R. H. Vesey
Post-offices, Assorting and routing case for.....C. H. H. Bailey
Potato-cutter.....J. Snyder
Pounder.....C. Fry
Powder, Apparatus for producing kefir.....A. Rosenberger
Power-generating means.....A. Pelletier
Power-transmission system, Hydraulic.....A. V. T. Day
Press.....G. E. Pancoast
Press-sweep.....R. A. Wakefield
Printing machine, Plate.....R. H. Kirk
Printing-press, Cylinder.....J. H. Barr
Printing-wheel.....I. S. Dement
Propeller.....W. D. Haynes
Pulley, Self-oiling.....G. A. Snyder
Pump.....P. A. Myers et al
Pump, Foot.....H. O. Harrison
Pump, Portable vacuum.....J. H. Templiu
Pumping air or other fluid.....T. Wiedemann et al
Pumping apparatus for vacuum-cleaners and the like.....W. H. Keller
Punch, Center.....R. A. Hogge
Pyrotechnics.....L. and J. Schulman
Rail anticreeping device.....B. Wolhaupter
Rail-joint.....C. D. Russell
Rail-joint.....A. R. Berryman
Rail-joint.....A. L. Stanford
Rail tie and fastening.....E. Wolhaupter
Rails, Anticreeping device for.....E. Wolhaupter
Railway-beds, Method and construction for the prevention of sink-holes in.....D. Marconi
Railway-switch.....J. R. Merritt
Railway-switch.....G. Shimp et al
Railway-tie.....F. Matějka
Railway-tie.....J. P. Boogher
Railway-tie.....J. B. McMillan
Railway-tie, Metal.....J. H. Penny
Railway-track construction.....2 pats.....J. W. Blower
Razor.....G. F. Hollon
Razor, Safety.....H. A. Kieselhorst
Razor, Safety.....C. F. Smith
Razor-stropper.....J. G. Bestgen
Reflector and attachment therefor.....H. D'Olier, Jr
Revolving tiltable chair.....M. Dexter
Rim and mortise lock, Combined.....C. A. Berry
Rocking-chair.....J. Smith
Rolling-mill for rolling car-wheels.....C. von Philp
Rope for power-trausmission purposes.....H. K. Holsman et al
Running-boards, Supporting-saddle for.....W. F. Cremean
Saddle, Riding.....C. W. Shepherd
Safety-gate.....E. Kraucher
Sash-lock.....G. Harmuth
Saw-shaper.....A. E. White
Scale dial, Computing.....J. E. Cochran
Scouring-machine.....H. F. Marshall et al
Screw-cutting-machine cutter, Wood.....G. Weber
Screw-machines, &c., Stock-stop for automatic.....C. B. Atwood
Scrubbing-machine.....G. Jacink
Seal, Snap.....E. J. Brooks
Seed conveyer, Pneumatic cotton.....B. W. and B. F. Tilley
Seeder, Force-feed.....T. B. Rowell
Separator.....M. McCoy
Sewage, disposal, Apparatus for.....B. J. Ashley
Sewing-clamp.....G. P. Van Wye
Sewing-machine.....S. L. Cohen
Sewing-machine attachment....H. Holforty
Sewing machine, Mantle.....S. Cohn
Shade fixture, Window.....A. J. Poteet
Shade-hanger, Vertically-adjustable.....W. B. Caswell
Shaft-coupling, Flexible.....J. W. Walters
Shafting, Flexible.....D. Schoening
Sharpener, Lawn-mower.....H. R. Atwater
Sharpener, Scissors.....I. O. Day
Sheet-conveying machine.....T. C. Dexter
Shepherd's crook.....M. L. Burch
Shipping-receptacle....F. I. Lamasney et al
Shoe-finishing machines, Leather-compressing mechanism for.....H. B. Bornside
Shovel and scoop, Combined.....A. F. Hammerschmidt
Shutter-bower.....F. E. Humphrey et al
Sign.....G. E. Jennings
Signaling device.....I. R. Johnson et al
Signaling system.....H. O. Rugh
Sizing compositions, Compound for use in preparing.....A. Vermeistch et al
Skate, Roller.....O. Kirkham
Sleeve-board.....F. Hofacker
Slimes, Treating metallic.....J. Dunstone
Smoke-stack.....A. Henry
Smoker's outfit.....W. Goss
Smoking-pipe.....J. Sjastram
Snow-guard.....H. H. Salls et al
Snow-plow, Foldable hand.....E. H. Gross
Soldering-iron and blow-torch, Combined..H. E. Adams
Soldering machine, Can-vent..E. C. Dickey
Sound-reproducing machine and record therefor.....F. H. Osborn
Spark-arrester and smoke-consumer.....W. T. and J. M. Lupton
Spark-plug, Adjustable.....J. S. Palmer
Spectacles.....J. W. Donaldson
Spike.....W. S. Crofutt
Spinning-ring.....E. A. Brigham
Spoke and felly clip.....J. Humphreys
Spraying apparatus.....J. I. Thornycroft
Sprinklers, Strut for automatic.....G. I. Rockwood
Squeegee, Fountain.....C. Brown
Stacker.....F. Wyatt
Stamps, labels, or the like, and for selling postage-stamps, Apparatus for affixing postage.....E. Haas
Steam-boiler.....W. M. Gentle
Stanchion for wagons, Adjustable live-stock.....O. T. Austinson
Steam-controlling device.....G. Resmer
Steering device.....H. S. Mustin
Stenciling apparatus.....A. Pokorny
Stiletto, Embroidery.....B. Gadrick
Stoking apparatus.....G. W. Bailey
Stone-gatherer.....G. H. Ford
Straw-burning furnace.....A. G. Johnson
Sugar, Apparatus for the treatment or preparation of.....E. Shaw
Superphosphate out of decomposition-chambers, Device for emptying.....K. J. Beskow et al
Supply-case.....H. F. Wallace
Switch apparatus.....W. H. Wheat
Switch or outlet box.....W. A. Bonnell
Switch-stand.....E. N. Strom
Table.....J. Pfrenzinger
Tablet, Sound-record.....J. Sanders
Tablets, Making sound-record....J. Sanders
Tail-stock.....W. A. Greaves
Tailor's level.....A. Erickson
Talking-machine.....H. Sheble et al
Talking-machine records, Case for holding.....H. C. Brown
Tank-indicator.....J. R. Smith
Tar-displacement system.....E. F. Lloyd
Taximeter.....J. G. MacPherson
Teaching wireless telegraphy, Apparatus for.....E. E. Butler
Telautograph instrument.....A. L. Golden
Telegraphic relay.....I. Kitsé
Telegraphy, Wireless.....F. G. Sargent
Telephone attachment.....A. G. Howard
Telephone attachment.....J. Kuhn
Telephone-bracket.....R. M. Vick
Telephone, Coin-controlled..R. L. Bowman
Telephone-mouthpiece, Antiseptic.....W. M. English et al
Thill-coupling.....A. C. Scheele
Thill-iron.....T. H. Schlarmann
Tin-plate, Apparatus for the manufacture of.....J. A. Lamp et al
Tin-reducing apparatus.....R. W. Scott
Tire.....2 pats.....I. B. Kempshall
Tire, Antiskidding.....I. B. Kempshall
Tire-inflator for automobiles..H. P. Maxim
Tire, Pneumatic.....A. Bonnett
Tire, Pneumatic.....H. L. Dazey
Tire, Vehicle.....I. B. Kempshall
Tire, Vehicle-wheel.....A. T. Scaramuzzi
Tires, Inner tube for pneumatic.....J. H. Brown
Tires, Joint-tie for cushion.....F. Buob
Toilet accessory.....O. Vale
Tongs for sheet metal.....F. J. Veiox
Tongues, Spring-support for vehicle.....W. F. Reschke
Tonnage-equating machine.....J. M. Daly
Tool, Combination.....C. Druck
Tools, Shield for.....A. D. Elliott
Top-prop.....F. A. Neider
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Truck side frame and journal-box, Car.....G. G. Floyd
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Vending-machines, Coin-director for.....W. Asbury
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(Continued in August Number.)

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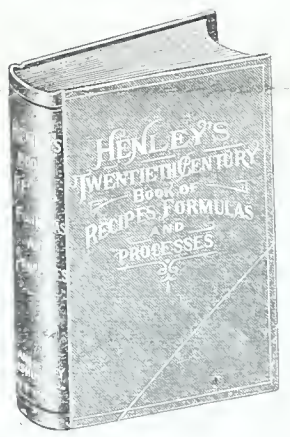

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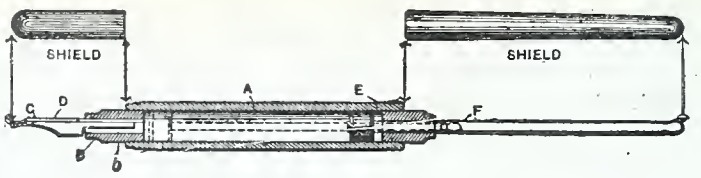

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A NOVEL TYPE OF TRANSPORTER.

By C. VAN LANGENDONCK.

A CONVEYOR of a new design, which has been in successful operation continuously during the past two years at mines at Corby, England, is herewith illustrated. It consists of a large wheel 80 feet in diameter, the rim being supported solely by wire tension spokes radiating from a light steel-work hub at the center, and tightened by eye bolts at the rim, the spokes being arranged in tangent fashion, the same as an ordinary bicycle wheel. The lower end of the hub is carried on roller bearings at the center, and the wheel without a load can be easily pushed around by a boy.

In practice it is driven by a single cotton rope, 1½ inch in diameter, running in a groove beneath the rim of the wheel. Projecting from the rim is an annular table 3 feet 6 inches wide, forming a platform around the entire circumference. The wheel may be revolved in either direction. When at work, the platform receives its load of earth at a uniform rate from a special mechanical hopper, and carries it around to a scraper or plow, which pushes off the dirt in a continuous stream. The plow is an important feature in the invention, as the operator may adjust it to any desired point of the circumference without stopping the wheel, and by this means a much more uniform distribution of the earth on the spoil bank is effected. The wheel rim is provided with a T-shaped head surrounding its entire circumference. Upon this is arranged a series of roller carriages, one of which serves to hold the leading end of the plow in position, and others serve to extend the operating cord; so no arm is required from the hub, and the plow may be held stationary at any point, while the wheel itself is revolving.

When it is stated that in most cases the land, after it has been turned over, has to be restored for agriculture, the importance of being able to adjust the point of discharge will be realized. The plow is set at an easy angle, and effects its purpose without much frictional resistance, while the wear and tear on the platform, which is of one-eighth of an inch plate, is practically negligible, six months' continual work at a capacity of 400 to 500 yards of sandy material per day not having sufficed to remove all the bloom from the plates.

The conveyor has not yet been tested to its full capacity. It is intended to deal with ½ cwt. of load to the lineal foot of platform, and can be revolved six times per minute without any effect on the load by the centrifugal force. This would give a practical capacity of over 500 cubic yards per hour. The material now being removed is tough clay and sand in about equal quantities, and it is found that large lumps of clay weighing nearly half a ton are easily taken care of.

The power required to operate the machine is small, on account of the absence of chains, rollers, idlers, etc. The wheel including the hub and platform weighs seven tons, and is supported horizontally on the cantilever arm, which is carried on trunnions. These enable the end of the beam to be lowered or raised, according to the thickness of the bed of rock, and to allow the locomotive and wagons to pass under. The under-frame upon which the whole machine is supported is provided with a turntable, which is a great convenience in narrow cuttings, as it allows the whole machine to stand obliquely with the cutting, independently of the direction of travel. A small boiler and steam engine are arranged on the revolving part, for driving the wheel and hopper by means of a clutch to propel the machine.

It is claimed for this type of conveyor that it offers an advantage impossible to its predecessors, owing to the fact that the spoil can be deposited behind the machine, as it advances along the cutting, thus avoiding the necessity of carrying it far, and keeping the base of the machine free from rolling lumps; and that, besides its usefulness for the work named, it will be found adaptable to many other purposes, particularly where the machine has to spread the material over a wide area.

Canned Air for Miners.

The shocking mine disaster at Cherry, Ill., adding another to the long list of calamities in this line of activity, has intensified public interest in the necessity of providing protective appliances for those who toil in the dark depths of the earth. A breathing apparatus which is simple and more readily available than others heretofore described in these columns, has been recently invented by an agent of the Geological Survey. It consists of a pocket air tank so constructed that a miner can carry it in his pocket and when occasion arises adjust it to his face, release a stop cock, and be supplied with enough oxygen to last him 30 minutes.

A rubber nose and mouth piece is made so as to fit closely over the lower part of the face, and attached thereto are two small tanks—one, of 3 x 3 inches, containing water, and the other, 5 x 3 inches, sodium-peroxide. A standard cock connects the two tanks, and when emergency requires it, a brass needle valve is released, allowing the water to drop into the chemical. This produces oxygen, which rises to the nostrils through a sheet iron tube that is joined to the mouthpiece above mentioned. The apparatus is capable of generating over two cubic feet of oxygen.

The inventor, Mr. Clarence Hall, was present last year as a government expert at several of the mines where accidents had occurred and lives been lost, and he observed that in many cases, if the miners had been supplied with some oxygen, they would have been able to crawl to places of safety. There were evidences after a cave-in of the section, that the entombed men had made efforts to escape but were overcome by the afterdamp. It seemed that the number of fatalities would have been lessened, with the aid of some means by which the miners could have been enabled to breathe a little longer.

Knowing that the chemical effect of water poured on sodium is to produce oxygen, Mr. Hall at once set to work on an appliance that would be simple and cheap, and easily transportable in the pocket. The devices of a similar nature now used are for the most part cumbersome and expensive. The apparatus finally perfected can be manufactured and sold for not over 50 cents, which will place it within the reach of any miner. A test was recently made at the geological survey at Pittsburg, the inventor going into an air tight smoke room and adjusting the breather to his nose and mouth as the room was being filled with smoke and gas to kill the oxygen. Although it would have been impossible for him to remain there under ordinary conditions, he remained in the dense atmosphere for half an hour without inconvenience.

Mr. Hall will not patent his invention, but has put it on the market for the benefit of the workmen of the country. It will be useful not only for miners, but for firemen and employees in ammonia plants, or other places where at any moment the supply of oxygen may be cut off and life endangered.

Electricity in Agriculture.

Some thirty years ago a Swedish professor sought to explain the Aurora Borealis by trying to imitate its appearance by electrical experiments. For this purpose he produced high tension discharges of various kinds and sent them through vacuum tubes until he got an effect very much like that of the northern lights. Some of these experiments were conducted in his green house, and he noticed incidentally that the plants seemed to thrive under the treatment and that the electrification thus produced in their neighborhood seemed to do them good. He also noticed as remarkable the flourishing development of plants in Arctic regions where the sunlight was very weak, and he attributed part of this growth to the influence of electrical discharges. He says that when the plants of Spitzbergen and Lapland have resisted the frequently destructive night frosts, they show a degree of development that greatly surpasses that of plants in more southern regions where the climatic conditions are more advantageous. This rich development appeared principally in the fresh and clear color of the flowers, in their strong perfume, in the rapid growth of the leaves on the trees, but particularly in the abundant harvest which different seeds such as rye, oats and barley will produce when, as before stated, they are not destroyed by the frosts. A bushel of rye will often produce 40 bushels, barley 20 bushels, and so on. The same is true of grass. These results are attained although the people cultivate their soil very imperfectly, using only plows and harrows of wood.

He pursued the matter by careful observations, taking test plants of crops, electrifying one crop (that is to say, discharging electricity in the air above them) and keeping a similar crop away from the electricity, in order to be able to compare them. Then he photographed the two crops side by side, and found in nearly all cases a marked improvement as the results of the electric treatment. He concluded that the needle-like shape of the leaves of the fir tree, and the beard of the ears of most cereals had the discharge of electricity as their function and found that they did indeed act in this way.

AMENDMENT TO PATENT LAWS.

Department of the Interior,
United States Patent Office,
Washington, D. C., July 1, 1910.

Attention is directed to the following amendment to the laws relating to patents.

C. C BILLINGS,
Acting Commissioner.

[Public—No. 296. H. R. 30585.]

AN ACT to repeal section forty-nine hundred and two and to amend section forty-nine hundred and thirty-four of the Revised Statutes, relating to caveats.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section forty-nine hundred and two of the Revised Statutes be, and the same is hereby, repealed.

Section 2. That section forty-nine hundred and thirty-four of the Revised Statutes be amended by striking out the following:

"On filing each caveat, ten dollars."

Section 3. That this act shall take effect July first, nineteen hundred and ten, and shall not apply to any caveat filed prior to said date.

Approved June 25, 1910.

Moving Pictures by Telegraph.

Sending photographs by wire is not new, and has already been described in these columns; but a device has now been invented by which it may become possible to telegraph a series of photographs one after the other, instantaneously, so as to give a moving picture reproduction of an event any distance away. Thus, a pageant in New York could be caught in a series of pictures, rapidly prepared for telegraph, and be seen almost immediately on screens in Milwaukee and Detroit.

The method of sending the photographs over the wire is interesting. An ordinary half-tone newspaper illustration, if examined closely, is seen to consist of innumerable dots of various sizes, which combine to form the picture with its lights and shades. The records in this invention consist of innumerable perforations in a sheet of paper, each hole corresponding to the dots of a half-tone photograph.

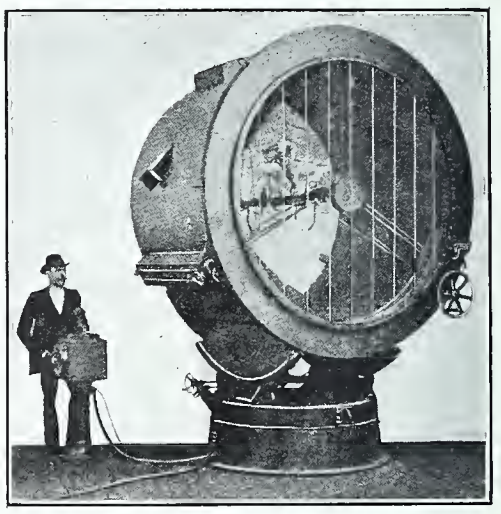
The perforated paper record, or perforation photograph, is laid on a metal base and drawn along under a set of metal brushes. The wider the hole, the more contact there is between the brush and metal underneath. By this means the amount of electric current sent to the distant viewing screen is varied. The currents of various strengths are made to illuminate more or less strongly small portions of the viewing screen, each of which corresponds to a perforation in the picture transmitted. The practicability of the idea, says the *London Bioscope*, has been demonstrated in experiments between a suburb of Paris and a station in that city.

How to Get Copies of Patents.

THE INVENTIVE AGE prints each month a list of the patents granted by the Patent Office. This list includes the name of the inventor, the title of the invention and the date of the patent. Anyone can procure through THE INVENTIVE AGE a copy of any patent included in the list, by giving the data and enclosing ten cents in stamps for each copy. There is no better way of keeping yourself informed about the progress of the arts, than by scanning the list each month and ordering copies of patents.

SEARCHLIGHTS.

There has been a decided advance in the efficiency of searchlights in the past decade, the improvement dating especially from the Spanish American war. The new lights have for their source an electric arc, such as is employed on many city streets. The rays from this lamp are concentrated and shot forward by means of parabolic mirrors, and it has been declared that objects 100 miles away may be seen by this light when the weather and other conditions are propitious. Signals have been exchanged between vessels lying 65 miles apart.



THE WORLD'S GREATEST SEARCHLIGHT.

A good searchlight has a range of three miles; that is, objects three miles from the light will be distinctly illuminated. Not long ago a test was made at the Brooklyn navy yard of one of these powerful lights, intended for use on shipboard. The shaft of light was turned in the direction of the Times building, about three miles distant, and while the observers in the tower at Brooklyn could not see anyone on the roof of the Times building, a man stationed there and looking at the searchlight, was dazzled by its brilliancy.

Each ship in Uncle Sam's navy is now supplied with a portable searchlight, made up as follows: On one carriage is mounted the generating apparatus, and on the other is the projector and a drum on which are wound some insulated wires. These wires transmit the electricity from the generator. Gasoline is the fuel which operates a little engine, of about six horse power. Some idea of the size of the large projectors may be obtained from considering the data of a 60-inch projector—a size common on our newest vessels. One weighs 6,000 pounds, and requires for its operation thirteen horse power. The upper carbon is one and a half inches in diameter, the lower, one and a quarter inches. The lighting power is about 1,200,000 candle power. These dimensions and figures, however, pall besides those of the searchlight shown in the illustration. This enormous apparatus, which was built in Nuremburg, Germany, has the distinction of being the largest searchlight in the world. It is of 316,000,000 candle power; its diameter is six and a half feet, and it gives a light visible at a distance eighty miles. It was constructed by the Shuckert Company, which makes a specialty of apparatus of this sort.

Before a searchlight is accepted by the navy, it is tested for its range by comparing the light given off with that emitted by a standard Shuckert projector. A test is also made on the mirror to see that it is truly parabolic. If the results of these two tests are satisfactory, the light is accepted.

SIXTEEN COLUMNS ADDED ON ONE PAGE.

The Census Department at Washington has just purchased twelve model 11 Remington typewriters equipped with Wahl Adding and Subtracting Attachments. These machines are to be used in connection with the intricate tabular work which will be done in the collection and tabulation of the figures of the next census.

These twelve machines which the Census Department has just purchased are remarkable machines. One of their notable features is that they are equipped to write and to add no less than sixteen parallel columns of figures on the same page. Nothing could better illustrate the wonderful advance in the capacity of both the writing and the adding machines as illustrated in the Remington Wahl machine, the latest invention in this field.

The development of the writing machine, from the time of the appearance of the first Remington thirty-six years ago, is a matter of common knowledge. An equally interesting story is the development of the adding machine. The adding machine is younger than the writing machine, nearly twenty years younger, and yet it has gone through an equally remarkable evolution in the few years of its life.

The primitive form of the adding machine was the machine which would add, but which would not print the items or total. It simply recorded the total in a register. The machine in this form proved that the idea was feasible, but was of limited utility because it afforded no means of checking the operator's work.

The next form was the machine which would add and print the items, at the same time registering and finally printing the total. This is the form of the so-called 81 key adding or listing machine of the present day.

The next is the machine which will write and add more than one column on the page—in fact, as many columns as the paper will hold. The capacity of the 81 key listing machine has always been limited in this field, never extending beyond two or three columns. A greater achievement—that of adding an immense number of columns on the same page, has been won by the Remington typewriter with Wahl Attachment and has been signalized by this notable order from the Census Department.

In the illustration there are five separate registers all mounted on the machine, and the operator is seen inserting a new register. They are applied from the left, and may be set wherever the operator wills. The number of registers or totalizers, as they are sometimes called, is limited only by the width of the carriage. The widest carriages will allow as many as sixteen totalizers. As one totalizer is for each column of added figures, it will be seen that when sixteen totalizers are used, sixteen distinct columns may be arranged and added on the same paper.

The machine which will add sixteen columns on the same page, all added by the same keys, is obviously a wonderful mechanism. This, however, is not the only notable feature of the Remington Wahl machine, nor is it even the greatest one. Here are two others equally important

The Wahl Attachment of the typewriter is the first adding machine which will mechanically subtract. If you are writing and adding a bill, it is the only machine on which you can subtract a discount, a credit or a freight allowance. If you are doing any kind of adding and make an error, by striking a wrong key, it is the only machine on which you can retrace your steps by direct mechanical process. It makes no difference whether you are adding one column or six or sixteen; you can subtract in any one of the sixteen columns just as easily as you can add—namely, by simple reverse mechanism. This subtracting feature makes the adding feature practical. It represents an advance in the practical efficiency of the adding machine as great as any that has gone before.

Last and greatest: The Wahl machine, for all its new and wonderful capacities, is not a separate adding mechanism. It is a part of the typewriter. In other words, it represents the union of the writing machine and the adding machine, and this union opens up a new and enormous field of labor saving in every kind of work where writing and adding are done on the same page. Such is the latest development of the writing machine.

Eyes for Submarines.

Though the submarine has been brought to a high standard of perfection in regard to its fighting qualities, it still labors under the great disadvantage it possessed in its early days. As its name implies, it is especially designed to travel under the water, and under such conditions the possibility of seeing where it is going is a vital factor. In short, it must possess an eye.

This "optic nerve," says the *Technical World*, is provided in the form of what is called the periscope, comprising a long thin tube some five inches in diameter, projecting from the top side of the hull to several feet above the level of the water. At the top of this tube a lens is mounted which projects the view therein recorded down the tube into an objective at its lower end which is in the submarine. Consequently, although the vessel may be traveling several feet below the surface of the water, the navigator may be able to ascertain his line of travel by means of this instrument, which is the only portion of the vessel observable above the water and which from its slender proportions is an inconspicuous object.

Efficient though this eye undoubtedly is, its range of utility is limited. When mounted singly the lens only covers a field of 60 degrees—i. e., 30 degrees on either side of the point directly ahead. The result is that the navigator is totally oblivious to what is happening on either side of or behind him. It was this limited range of vision that brought about the recent disaster to a British submarine in the Solent. A steamer approaching Southampton failed to observe the submerged submarine in its path, while the navigator of the latter was quite ignorent of the approach of the vessel behind him. The result was that the submarine was crushed and all the crew drowned.

In order to overcome this disadvantage, lenses have been disposed in the form of a Maltese cross at the periscope tube, but inasmuch as the range of vision of each is only 60 degrees, the aggregate field covered is only 240 out of the 360 degrees of the circle. A lens that would command the whole circle was what was needed, but opticians have held it impossible to provide such an appliance. Recent trials in London of a new periscope, however, have shown that the supposed impossibility is an accomplished fact. As in successful photography, the value of the new device is all in the lens, which is something new to optical science. The periscope tube is similar to the one now used, but at its upper extremity is a convex thin mass of glass resembling a small lamp globe. In this the whole of the surrounding area is reflected, and the image thus caught is projected down the tube into an eyepiece. Some very abstruse problems in optics had to be solved, in devising this appliance, in order to correct distortion of the picture, astigmatism and aberration. These corrections are effected by projecting the image caught at the top of the tube, through a nest of 17 lenses, placed in relative position in the tube itself. The range of the instrument is 8 miles, and the picture obtained is clear and brilliant. The perfection of this device ranks as an achievement in optics and in submarine engineering.

CLEVER NEW PATENTS.

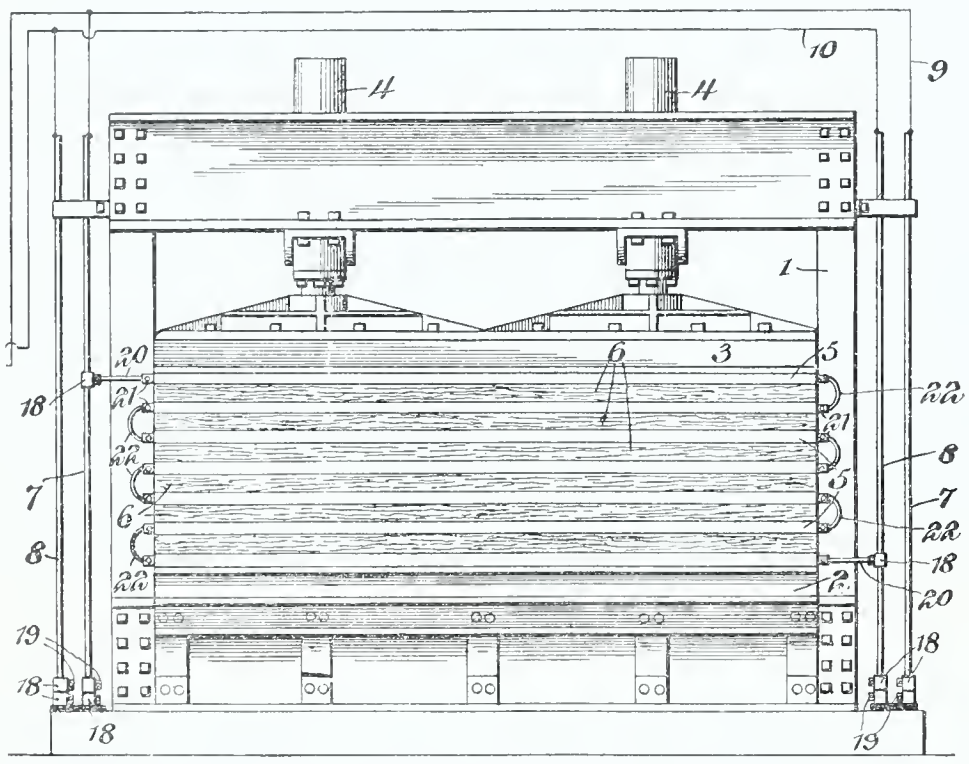
NEW ELECTRIC PRESS.—SHUTTER AND VENTILATOR.—WASHING MACHINE.

New Electric Drying Press.

A most interesting and useful improvement has just been patented by George Kelly, of Hinsdale, Ill., in an electric drying and vulcanizing press, which is particularly adapted for use in the manufacture of rubber goods, and we believe it will be welcome to all manufacturers and users of vulcanizing and drying presses, rubber articles and other fibre sheets and boards, for the manufacture of which it is well suited.

The improvement consists in the use of thin metal plates for drying or vulcanizing, in place of the old fashioned thick steam-heated platens now in general use, these thin metal plates being heated for drying or vulcanizing purposes by electricity.

The improvement will be readily seen and appreciated by those who are familiar with and thoroughly understand the vulcanizing presses now in general use in the manufacture of rubber goods, and especially when they consider the disadvantages of the presses now used, and the work necessary when drying or vulcanizing a large number of thin sheets, such as matting, belting, packing, fibre boards, and other like articles.



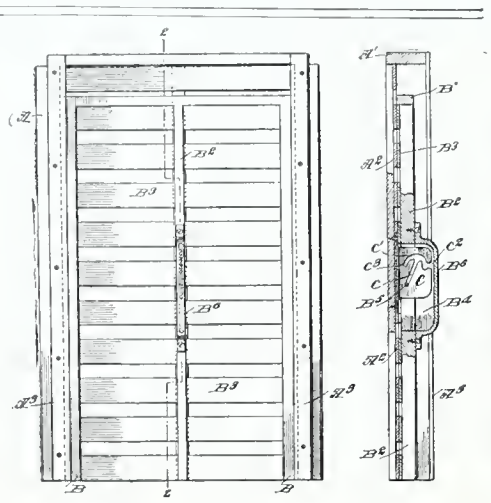
The invention and its advantages need no further explanation to a well-posted and up-to-date rubber man, and especially when he examines and figures out the difference between both the cost and the efficiency of this press and the presses now in general use, for he will readily see the vast difference between the amount of material that can be dried or vulcanized within a given space when using these thin metal plates, and the material that can be dried or vulcanized in the same given space when using the thick, steam-heated platens now in general use. The accompanying illustration shows a sectional view of the press with the thin plates in position.

For example, take a steam press 48 x 48 inches with 6 platens, and allow 6 inches for the thickness of each platen, and supposing the sheets to be pressed are each ¼ of an inch in thickness. This would make 6¼ inches of space for each platen and one layer of goods, and 6 platens with the corresponding layer of goods to each platen would occupy 37½ inches of space.

Now the metal plates used in this new press are each ¼ of an inch in thickness, and each layer of goods is also ¼ of an inch in thickness, making a total thickness of ½ inch for each plate and one layer of goods, and in a space of 37½ inches as above mentioned, could be placed 75 plates with their corresponding layers of goods, as against the 6 platens with their corresponding layers of goods when using the old press: or in other words, the inventor accomplishes just 12½ times as much work in the same space with the new press as is performed with the old press. This ratio, as will be readily seen, will vary inversely according to the thickness of the layers of goods, but it serves to illustrate the comparative efficiency and amount of work that can be accomplished with the two presses, and also the greatly reduced expense in the manufacture of the press as well as in its operation.

Shutter and Ventilator.

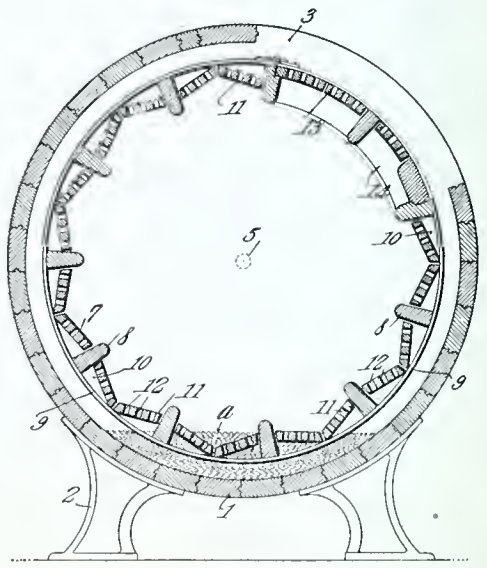
The passing of the old style outside roll slat shutters from modern house building, as shown by the publications of the foremost architects of the day, has created a demand for a simple, cheaply manufactured and yet strongly and compactly constructed shutter and ventilator, which may be readily manipulated by any one. An effectual inside blind has been recently patented by William P. Rylander, of San Marcos, Texas. It is intended to cover the lower sash only—the upper one being protected by the ordinary blind—and to serve as a screen when the window is open. In the cuts, which illustrate an elevation



of the inside of the shutter, and a vertical section of the same adjusted as a simple ventilator, two frames are shown, one stationary composed of rigid slats A^2 and one adjustable, with slats B^3 held within the main frame. At the center of the bar B^2 of the supplemental frame is a slot B^4, with a transverse pin B^5; and at a corresponding place on the main shutter is a metal plate C, which projects into the slot B^4 and has a diagonal slot a opening into a curved slot c^1, which meets a horizontal slot c^2, the outer end of the curved slot forming a seat to receive the pin when the movable slat is in position to shut off light and air. The other end of the curved slot forms another seat for the pin. When it is desired to give free ventilation, the hand piece B^6 is manipulated to cause the pin to seat itself in the bottom of the diagonal slot c, so that the slats of the movable part lie closely alongside those of the stationary part, the open spaces registering; which gives light and air to the room. To secure privacy, the pin is raised from the slot and brought to its seat at c^4; this moves the movable shutter away, so as to allow circulation of air, but its slats will stand opposite the open spaces of the other. When it is wished to make the shutter solid, the pin B^5 is moved along the slot to the seat c^3, whereupon the slats of the movable blind will overlap the open spaces of the ordinary blind, and effectually cut off light and wind. It will be seen that with this device, privacy can be had in a room without cutting off ventilation, and thorough ventilation can be had with the shutter appearing like a solid blind. This position is specially desirable when a draft is to be avoided.

Washing Machine.

Washing machines are among the most popular of the devices for economizing labor in the household, and an apparatus in this line has been patented by John H. Ostertag, Columbia, Pa., which has a revoluble container, and an arrangement whereby splashing action of the water is attained during the rotation thereof, this action causing a number of jets of water to move upwardly against the fabrics within the machine. The figure shows a vertical transverse section of the device, and it will be seen that there is a cylindrical casing rotatably mounted on supports, and having an inlet opening 3 of any size. Arranged concentrically within the heads of the casing are trunnions 5 extending from the centers of the heads of the revoluble container, the heads having angular recesses 7 bisected by slats 8 which connect the heads. Hoops 9 extend around the ends of the slats and bear against the outer angle portions of the heads, there being angular filling blocks 10 interposed between the hoops and strips 11 which extend longitudinally between the heads. These strips bear on the inner walls of the recesses 7 and are in pairs, one pair being between every two slats and the strips of each pair converging outwardly as shown. Each strip has apertures 12, and a closure 13 is hinged to one of the slats. The machine is partly filled with soapy water and the clothes placed in the container. It will be noted that the level of the water passes through the container and that the advancing strip of each pair is brought flat against the surface of the water when the container is rotated. This causes a splashing action, and results in the projection of numerous jets of water upwardly through the openings



12. The formation of these jets is facilitated by the slats, which deflect the water in their path and drive it toward the apertures. The jets dash against the clothes, which are revolved within the container so that all portions are brought into the lower part. The slats carry the fabrics upwardly and sweep part of the water along, so that the contents of the machine will be kept agitated and will be subjected not only to the revolving motion but the action of the upwardly spurting jets of water. The machine is easy to operate, it being unnecessary to utilize any removable parts such as clothes pounders, and can be turned either to the right or the left.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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AMERICAN GRAPHOPHONE CO v. LEEDS & CATLIN CO. et al.

(Circuit Court of Appeals, Second Circuit. April 31, 1909. 170 F. R. p. 327.)

1. PATENTS—INVENTION--ANTICIPATION.

In contemplation of law an invention does not exist until the inventor's ideas have been reduced to practical form, either as the basis for a patent or an anticipation of another's invention.

2. PATENTS—ANTICIPATION.

The naked assertion that a certain result has been accomplished, without describing the means which produced it, is insufficient as an anticipation.

3. PATENTS—ANTICIPATION AND INFRINGEMENT-PROCESS OF MAKING COMMERCIAL SOUND-RECORDS.

The Jones patent No. 688,739, for a process of producing commercial sound-records, was not anticipated by the Adams-Randall British patent No. 9,996 of 1888, and is valid. Also held infringed.

LIBERMAN et al. v RUWELL et al.

(Circuit Court of Appeals, Third Circuit, May 18, 1909. 170 F. R. p. 590.)

1. PATENTS—CONSTRUCTION — EQUIVALENT PARTS.

Where a patent depends for its novelty over the prior art upon a single limited feature of construction, the claims cannot be expanded by any doctrine of equivalents to cover a device which lacks that single essential feature.

2. PATENTS—INFRINGEMENT — CIGAR ROLLING TABLE AND WRAPPER CUTTER.

The Liberman patent, No. 668,921, for a combined cigar rolling table and wrapper cutter, construed, and, as limited by the prior art, held not infringed.

GENERAL ELECTRIC CO. v. SMITH.

(Circuit Court, D. Massachusetts. June 11, 1909. 170 F. R. p. 593.)

PATENTS — VALIDITY AND INFRINGEMENT — ELECTRIC SAFETY-FUSE.

The Thalacker patent No. 502,541, for an electric safety-fuse, consisting of a combination of a main safety-fuse, a box or case inclosing the same, and a small auxiliary fuse, not fully enclosed, which blows at the same time as the main fuse, and the purpose of which is to indicate the blowing of the main fuse, was not anticipated and discloses invention, but is not infringed by a device which is without the combination and structurally different, except that it has an auxiliary fuse as an indicator.

HANCOCK v. BOYD & GETTY.

(Circuit Court, D. Kansas, Second Division. May 14, 1909. 170 F. R. p. 600.)

1. PATENTS — INVENTION — SIMPLICITY OR OBVIOUSNESS OF DEVICE.

The fact that the distinguishing feature of a patented mechanical combination is simple and apparently an obvious improvement on prior structures does not negative invention which must be conceded where the structure as a whole is undoubtedly superior to any in the prior art, and was the first to achieve unqualified success both in results and commercially.

2. PATENTS — SUITS FOR INFRINGEMENT—DEFENSE OF ANTICIPATION—BURDEN OF PROOF.

The granting of a patent is prima facie evidence of the novelty of the device described, and the burden of proof to establish anticipation rests upon the defendant alleging it.

3. PATENTS—VALIDITY AND INFRINGEMENT —ROTARY DISC PLOWS.

The Hardy patent, No. 556,972, for a rotary disc plow, the distinguishing feature in the combination of parts being the backward inclination of the plow disc from a vertical plane, so that the disc, when in operation, may carry the furrow slice on its face, may have a suction motion drawing it into the earth, and may present a cutting instead of a scraping edge to the soil at the bottom, was not anticipated, and taking the combination as a whole discloses invention. Nor is it invalid because the precise angle of inclination of the disc is not stated in the claims, such angle as stated in the specification being subject to adjustment to meet varying conditions. Claim 2 also held infringed.

QUEEN & CO. v. GREEN.

(Circuit Court, E. D. Pennsylvania. June 14, 1909. 170 F. R. p. 611.)

1. PATENTS—SUIT FOR INFRINGEMENT-ACTS CONSTITUTING VIOLATION OF INJUNCTION.

A party against whom a preliminary injunction has issued, restraining him from infringement of a patent and from constructing or selling a device found to infringe, and which clearly infringed if the patent was valid, is guilty of contempt for violating the injunction, where he merely makes a formal and immaterial change in such device, which does not in any way change the principle of operation, and which was apparently adopted for the express purpose of evading the injunction.

2. PATENTS — SUIT FOR INFRINGEMENT — VIOLATION OF INJUNCTION.

While the fact that a party, charged with contempt for violating an injunction against infringement of patent, acted under the advice of counsel, is to be considered in deciding whether he shall be punished, it is not a defense, if continued infringement is found.

BROOKFIELD et al. v. NOVELTY GLASS MFG. CO.

(Circuit Court, D. New Jersey. Jan. 27, 1908. 170 F. R. p. 830.)

1. PATENTS—INFRINGEMENT—DAMAGES RECOVERABLE.

Where the owner of a patent was not individually engaged in the manufacture or sale of the patented article, he cannot recover from any infringer as damages the profits of which a corporation licensee in which he was a stockholder was deprived by the infringement where such corporation is not a party to the suit, nor any part thereof, in the absence of proof of the terms of the license.

2. PATENTS — INFRINGEMENT—PROFITS RECOVERABLE.

Where the claims of a patent infringed are for a combination of old elements, the invention consisting in the combination, the infringer is liable for all of the profits made by the use of such combination.

3. PATENTS—INFRINGEMENT — PROFITS RECOVERABLE.

The profits recoverable from the user of an infringing machine include all of the profits made upon the product of such machine, where the infringer could have made no profits by the use of any other machine then known and open to his use.

4. PATENTS—INFRINGEMENT — PROFITS RECOVERABLE.

That the profits made by an infringer were in part the result of an alleged unlawful agreement between competing manufacturers to maintain prices, to which agreement a corporation in which the owner of the patent is a stockholder was a party, does not lessen the liability of such infringer for the profits made by his infringement.

DIETZ et al. v. HORTON MFG. CO.

(Circuit Court of Appeals, Sixth Circuit. May 22, 1909. 170 F. R. p. 865.)

1. TRADE-MARKS AND TRADE-NAMES—SUBJECTS OF OWNERSHIP—PRIORITY OF USE.

Neither complainant nor defendant held entitled to the exclusive use of the word "Globe" as a trade-mark for washing machines; it appearing that it had been in use by another manufacturer and his successors in business, whose machines were sold throughout the country, for some years before its adoption by either, and that such use continued for some years afterward.

2. TRADE-MARKS AND TRADE-NAMES-TITLE —ASSIGNABILITY.

The right to a trade-mark cannot be assigned, except as an incident to the sale of the business and good will in connection with which it has been used, or as an incident to the sale of the premises where the article has been made and has acquired a special reputation in connection with such place.

3. TRADE-MARK AND TRADE-NAMES—ABANDONMENT—UNFAIR COMPETITION.

Where the owner of a trade-mark has permitted other manufacturers to use it for a number of years without objection, it becomes so far common property that the only restriction which can be imposed on its use is that each user shall so identify his goods as to indicate their origin, and prevent confusion and deception and unfair competition.

NOVELTY GLASS MFG. CO. v. BROOKFIELD et al.

(Circuit Court of Appeals, Third Circuit, June 1, 1909. 170 F. R. p. 946.)

1. PATENTS—PRESS FOR MAKING GLASS INSULATORS-VALID AND INVALID CLAIMS.

The Kribs patent, No. 542,565, for improvements in presses for making screw insulators, although made up of old elements and of narrow scope, was not anticipated and discloses invention; and claim 2, which is accurately expressive of the device is valid, although claim 1 is bad as being too broad, as well as claims 3, 6, 7, and 8, which are merely duplicates of 1, and 2, differentiated by elements necessarily implied or by simple mechanical expedients, which any one could supply. Claim 2 also held infringed.

2. PATENTS—INVENTION-EFFORTS OF OTHER INVENTORS—SUCCESS OF THE DEVICE.

In judging of invention, in case of doubt, regard may be properly had to the efforts of other inventors in the same field, particularly where there are not a few both before and since, as well as to the difficulties to be overcome and the success of the device, where in the number and quality of the articles produced it has been marked.

3. PATENTS — COMBINATON AND AGGREGATION—SUCCESSIVE STEPS IN OPERATION OF MACHINE—UNITARY RESULT.

The test as to whether a device is a patentable combination or a mere aggregation of parts having no combined action is whether there is a new unitary result to the production of which the different elements co-act; and where this appears it is immaterial that there are different steps in the operation to which the different parts are successively addressed. It is not necessary that the article manufactured shall be produced at a single stroke, in which all the elements are involved.

4. PATENTS—ORIGINAL INVENTOR — MINOR FEATURES.

Upon conflicting claims of different parties to have been the originator of the invention, the question is whose was the main idea, and the fact that minor features may be attributable to others is not controlling. Evidence examined, and Kribs, and not Jordan or others at the Brookfield Works, where experiments were made, held to be the original and first inventor of the device in suit.

5. PATENTS—INTERFERENCE PROCEEDINGS—EFFECT OF IN SUBSEQUENT SUIT.

Where, upon conflicting applications, interference proceedings have been declared, upon which the application of one party is dropped and the other decided to be the original and first inventor, and a patent issued to him, upon a subsequent suit for infringement, in which the same issue is raised, while the interference proceedings are not conclusive, it is for the losing party to overcome their effect.

6 PATENTS-CLAIMS-OMISSION OF ESSENTIAL ELEMENT — DUPLICATION — "MOVABLE MOLD ADAPTED TO TRAVEL."

Where, in a press for making screw insulators, an essential element, to differentiate the prior art, is a rotary table or its equivalent to support the molds and carry them in a fixed and predetermined path to and from other parts of the machine, by which the process involved is carried out, the specification of a "movable mold adapted to travel," although under some circumstances competent to imply a structural arrangement by which the mold is moved back and forth mechanically, in a predetermined way, between designated points, the specific means employed for doing so in the patent in suit being of the essence of the invention, a claim in which it is not made an element of the combination is invalid, as being too broad; or if disregarding this, the omitted element is read into the claim as being implied, it will also be bad where, as here, it thereby duplicates another claim.

7. PATENTS—INFRINGEMENTS—ACCOUNTING FOR PROFITS FOR USE OF INFRINGING MACHINE-MEASURE OF-SAVING THEREBY OVER USE OF OTHER NONINFRINGING MACHINES.

In an accounting for profits for the use of an infringing machine, the patent not being for the product, but for the machine itself, the complainant is entitled merely to what was saved to the defendants by the use of the patented machine over others which were open to them to use; that is to say, in the present instance, the difference between the cost of insulators as made by the machine of the patent, and the cost as made by other machines which had gone into public use which it displaced. But where, according to the evidence, salable articles at the market prices could not be so made without loss, the whole profit on such articles made by the use of the infringing machines may properly be taken as having been so saved.

ELECTRIC CONTROLLER & SUPPLY CO. v. WESTINGHOUSE ELECTRIC & MFG. CO.

(Circuit Court of Appeals, Sixth Circuit. June 24, 1909. 171 F. R. p. 82.)

PATENTS—INVENTION— EVIDENCE — SUCCESS OF DEVICE.

The fact that a patented device overcame defects in prior structures which persons skilled in the art had for several years been trying unsuccessfully to remedy, and went into immediate and successful commercial use, is persuasive evidence of invention.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Herbert K. Tabler, Plymouth, Ill. Gate.—An object of the present invention is to provide combined gate actuating and latch operating mechanism, adapted to positively open and close the gate, and capable of swinging the same either slowly or rapidly by a single continuous pull, the mechanism being designed for operating gates opening in one direction only, and enabling such gates to be opened to an angle of ninety degrees so as not to obstruct the roadway.

Charles J. Turner, Monticello Iowa. Box Lid Clamp.—This invention has for its object to produce a box lid clamp, designed for use on various sizes and covers of boxes, such as cigar boxes, cracker boxes, and the like, and capable of being readily applied to and removed from a box, and adapted to support the lid of the box at the desired inclination for advantageously displaying the brand of a cigar, or other advertising matter on the lid.

John B. Williamson, Louisville, Ky., inventor; Sliding Cap Company, same place, assignee. Condiment Holder.—This invention relates to a condiment holder, adapted to be readily operated to cover and uncover a plurality of discharge openings through which the contents of the holder may be shaken when the openings are exposed. It consists of a cap slidably interlocked with integral guides formed on the receptacle, means being provided for limiting the sliding movement of the cap in both directions.

Joseph Olsson, St. Ellwood, Sault Ste., Marie, Michigan. Gage Cock.—An object of the present invention is to provide a gage cock with a double valve, in which one valve relieves the pressure from the other during the opening operation, thus eliminating the leakage so common in cocks of the single valve type. Both valves are operated by a common operating means, thus making said valve movements positive and not wholly dependent upon the steam pressure against the valves.

William J. Holder, Roxton, Texas. Harness. Assignors of one-fourth interest to C. Rabb, and J. J. Coppedge, Lone Oak, Tex.—The principal object of the present invention is to provide a holdback mechanism to be employed in connection with harness, which will eliminate the necessity of a breeching. thus producing a cleaner harness and one that leaves the animal's limbs entirely free. Another object is to provide a harness that can be readily applied to and removed from an animal, one which can be easily and quickly hitched to or unhitched from a vehicle, which will not wear upon the horse, and one which will afford a great degree of safety, thus being particularly applicable for use on young and inexperienced horses.

William F. Yard, Trenton, N. J. Nozzle.—An object of the present invention is to provide a spraying nozzle, which may be employed for delivering insecticides, white wash, and the like substances, and one which will produce a finely divided spray, which will distribute the solution over a comparatively great area, and which can be easily and quickly freed from the accumulation of solid material, should it become clogged therewith, without the necessity of dismembering the nozzle.

Edgar Shultz, Newtown, Ind. Wire Fence Clutch.—This device relates to wire fence building, and has for one of its objects to expedite the running or stretching of a fence wire by providing a simple device of few parts which will, when the wire is extended therethrough. hold the same by the tightness of the wire exerting pressure on a cam and thus force the opposite end of the cam into the wire. The device is provided with a screw threaded shank and a squared end which will permit the same to be quickly and easily attached to any wooden fence post.

Charles E. Wood, Gas, Kansas. Emergency Operating Table. — The principal object of the present invention is to provide an operating table, which being perfectly sanitary and easily cleaned, may also be folded in compact form and thus easily transported to the place required, providing a table that may be adjusted to the length of the party to be operated upon, so that all parties regardless of their height will have a suitable rest for the head and feet. The table is constructed with drawers in which the instruments are kept, in such a manner that when the table is in a folded or telescoped position, the drawers are locked, and when the table is in an open position they are readily accessible.

Frank W. Post, Los Angeles, California, and Archie M. Morley, South Pasadena, California. Secondary Battery. — One of the features of this invention is to provide a battery grid or accumulator plate, adapted to be used in connection with secondary batteries, which can be filled with peroxide or active material several times before breaking, and one which is adapted to withstand, without injury, high charges and discharges, and which will effectively maintain the active material in place.

William B. Wallwork, Kansas City, Mo. Carcass Splitting Machine.—In butchering or dressing the carcass, it is the usual custom to split the same from the tail downwardly in halves, before it is passed to the chill room, and the common practice is to do this splitting by hand, the operator using an ax or cleaver. An object of the present invention is to dispense with this crude method, and in place thereof substitute power operated circular saws, so positioned that when the beef, which is suspended on an overhead track, is advanced toward these saws the splitting operation will be easily and quickly accomplished.

Reynolds W. Vredenburg and Chas. B. Gilmore, Springfield, Ill. Combined Lock and Latch.—Heretofore in the manufacture of door locks and latches, it has been the custom to provide each lock with a separate catch and bolt. An object of this invention is to dispense with the bolt or locking member and combine it with the catch, and also provide operating means for the combined catch and bolt in the form of the well known knob, and equipped with a means whereby the combined catch and bolt may be locked either by a key or a separate mechanism.

Samuel B. Sickelsmith, New Haven, Pa. Trolley Wheel. — One of the principal objects of this invention is to provide a structure in which the wheel is more completely relieved of the rock and play of the car, and can move more quickly, and adapt itself to the changes or inequalities of the wire against which it travels, than is the case with trolley wheels journaled directly on the ends of long poles, as is now the custom. It will also reduce the liability of the trolley wheel becoming highly heated or its jumping or disengaging the wire.

Louis H. Sternberg, Brooklyn, N. Y. Advertising Character.—This invention has for one of its objects to provide a simple, inexpensive, transparent and light structure in the form of a letter, character or sign, which is readily applicable to a support, such as a show window, and is provided with a re-enforcing rib or frame, which will provide means for attaching the letter to a support and will also space the letter from the support. The article is so constructed that it can be readily sent through the mails without danger of breakage, and can be applied to a window by a person unskilled in the making of signs.

Eugene Wiet and Henry A. Gamble, San Francisco, Cal. Sheet Metal Pipe.—An object of the present invention is to dispense with the use of cast metal pipes in the conveying of steam, water or other material, and substitute a sheet metal pipe, light in weight and cheap in manufacture, the method of construction being such that said pipes may be provided with co-acting ends, respectively, having smooth exterior and interior faces and contracting portions so that the contracted portion of one pipe may be fitted into another pipe.

David Kimmel, Warren, Pa. Oil Well Bailer.—The primary object of the present improvement in well bailers is to provide novel valve mechanism which can be readily applied to and detached from the body of the bailer without the necessity of dismembering the same, and also to provide a straining means which will prevent the ingress of sand, slate and particles of foreign material large enough to interfere with the proper operation of the valve.

Stephen I. Armbruster, Shelby, O. Wire Working Machine.—The principal object of this invention is to provide a wire looping machine, which will loop either or both ends of a wire, have a large output and be thoroughly practicable, that is capable of being adjusted to wires of different lengths and diameters, and one which is particularly adapted for producing terminal loops on piano wires, wires for brick machines, or ties for hay and other bales.

Frank G. McPherson, Beaver Falls, Pa., inventor; Thomas O. McPherson, same place, assignee. Sled.—This invention relates to children's sleds, and the objects are to provide a sled wherein the runners are formed of one piece of metal in the form of a bent bar or rod; and also to increase the resilient strength of such runners by providing coils formed in said bars at the front and rear of the sled, which will be compressed or tightened by any weight on the sled and act to take up the shock of impact or to resiliently support the weight of the rider.

Frank G. McPherson, Beaver Falls, Pa. Mat.—The principal object of this invention is to provide a matting or tread means for use in bars, soda fountains, street cars and various other places, which will be very flexible so that it can be rolled into small compass, will maintain a perfectly flat condition, and is not apt to become bent or misshapen. Also to provide a mat that is elastic so as to make it more comfortable for those who may have to stand thereon, and at the same time leave an unobstructed space beneath it for the distribution of drippage or other liquids that may accumulate.

Frank G. McPherson, Beaver Falls, Pa. Mat.—The principal object of this invention is to provide a mat composed of strips of material which furnish tread surfaces, and spacing members placed between each tread strip. A further object is to provide a new connecting means for said strips and spacing members by which the mat may be rolled into small compass, the connecting means being made sectional which will permit the taking out of one section, without disturbing the remaining ones.

Thos. C. McPherson, Beaver Falls, Pa., inventor; Keystone Wire Matting Co., same place, assignee of one-half interest. Mat.—The principal object of this invention is to provide an all metallic mat composed of sections which are adapted to fit one within the other, and which may be rolled or folded in a small compass. Another object is to provide a mat with legs, which are adapted to hold it a short distance from the floor or other surface, and to employ novel and efficient means for securing the said devices on the body of the mat without weakening the frame.

Thos. C. McPherson, Beaver Falls, Pa. Mat. — This device is in the nature of an improvement on the above-mentioned patent. An object of this invention is to provide a metallic mat with re-enforcing or strengthening means, which will not interfere with the folding of the mat, and will add to the ornamentation of the same.

Thos. C. McPherson, Beaver Falls, Pa. Steel Mat.—The principal object of the invention is to provide a mat of a configuration, which will be economical in the amount of material employed, reducing the number of pivot points and at the same time securing a comparatively great length of scraping edge. A further object is to provide a mat of this character with means that will prevent its easy sliding and also the objectionable feature of its scratching the surface upon which it is placed, thereby making it serviceable upon marble, stone or polished floors.

Richard Yearneau, Clark, South Dakota. Rent Collecting Means for Telephone Service.—One of the objects of this invention is to provide a coin-controlled attachment for telephones which can be installed with any system and instruments now in use without altering or disturbing the same, said attachment being provided with means whereby the central operator may short circuit the lines, thus cutting out the parties until another coin is deposited in the chute.

Richard Yearneau, Clark, South Dakota. Rent Collecting Means for Telephone Service.—One of the objects of this invention is to provide a telephone rent collecting system which will engage and hold the coins when inserted, and thus keep the system in operative position until they are released by the central operator and the system closed until coins are again inserted. Another object is to provide a series of openings and different-sized contacts which will be adapted to receive and accommodate coins of various denominations.

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FOR SALE or royalty—Patent No. 955,210, an attachment that converts any walking turning plow into the best sulky plow made. Can be manufactured cheap and sells at a big profit. Address, L. H. Ruch, R. D. No. 3, Winchester, Tenn. oct

FOR SALE—U. S. Patent No. 958,546, issued May 10, 1910. Railway Spike. Impossible to work loose of itself. Impossible for rails to spread. Any reasonable offer considered. Address, R. A. Rossmeisl, Whitingham, Vermont. oct

FOR SALE or exchange for real estate—U. S. Patent No. 950,630, dated March 1, 1910; Canadian Patent June 6, 1910. Trolley Poles. Can't come off wire. Very good invention. For particulars and price address, Henry Brod, St. Charles, Mo. oct

FOR SALE—My invention will heat and light the world and run all steam and electrical railroads and the only expense is the plant run by gravity air pressure. For particulars address, Phillipp Stauch, 106 East Illinois St., Chicago, Illinois. oct

FOR SALE—Patent No. 951,920. Adjustable sawing machine, for sawing perfect circles. Can be manufactured at small cost. Will sell outright or part cash and royalty. Address, Doc H. Smith, Moundridge, Kansas. oct

FOR SALE—Patent No. 900,737, dated Oct. 13, 1908. Novel and practicable hank for use on double and single stays of the largest ships or smallest yachts. Address patentee and owner. Samuel A. Jackson, Box 26, Kittery, Maine. oct

FOR SALE—Patent No. 956,542, dated May 3, 1910. Peterson's Automatic Damper Control. Simple, durable, reliable and practical. Something needed in every home, store, factory and public building. Will sell outright, or will consider a reasonable royalty proposition. Address, Hjalmar Peterson, Falun, Wisconsin. oct

FOR SALE—Patent No. 891,082. Folding Box or Crate. Something new and adapted for shipping fruits, farm and poultry products. Easily adjusted, and when folded occupies a comparatively small space. Can be constructed very light, but method of construction makes it very durable and is also provided with means for sealing. If interested address, J. A. Lamp, No. 1109 N. Evans Ave., McKeesport, Pa. oct

FOR SALE—U. S. Patent No. 950,302, and Canadian Patent No. 120,052. Bottle Washing Machine. This machine washes and fills 576 bottles in 15 minutes. For copy and particulars, write to Ronald J. Pfeifer, Box 53, R. F. D. No. 1, Callicoon, N. Y. sep

FOR SALE—Patent No. 910,785, dated Jan. 26, 1909. The ultimate universal detachable sanitary soap dish. Holds soap firmly when throwing water out. A boon to all homes, camping and outing parties. Can be manufactured at small cost. Apply to T. C. Colton, Griswold, Man., Canada. oct

FOR SALE or lease on royalty—Patents on can holders and cap wrench. The best in the world without exception. Will send samples to any interested parties. Canadian patent issued Nov. 30, 1909; U. S. patent issued March 8, 1910. Would like prices on manufacturing. Address, Elias Smith, Box 50, Skinners Eddy, Pa. sep

FOR SALE or on royalty—U. S. Patent No. 935,342, issued Sept. 28, 1909: Canadian patent No. 124,511, March 15, 1910. Novelty skein holder. Its purpose is to hold silk skeins of thread straight, clean and convenient. One strand of thread can be drawn out without disturbing the others. Saleable wherever silk embroidery is used. For particulars, write Fred E. Weightze, 1246 Champa St., Denver, Colo. sep

FOR SALE or royalty—U.S. Patent No. 839,157, Tablet Making Machine. Used by cereal food, chemical and confectionery manufacturers. Capacity unlimited. If interested, address, 413 Ogden Building, Chicago, Illinois. sep

FOR SALE—Patent No. 949,128. Rubber Book Protector. Adjustable, useful and ornamental in any beautiful design. Little cost. Will sell any state or Canada rights. Want to hear from manufacturers for cash or royalty. Address, Miss B. C. McAndrews, Merrill, Maryland. aug

FOR SALE—U. S. Patent No. 934,899. I will sell outright, or have manufactured on a royalty, my reversible ratchet wrench. Write for drawing and specification. Something new. Address, Fred W. Eilart, No. 504 Parker St., McKeesport, Pa. aug

FOR SALE or on royalty—U. S. Patent No. No. 952,432, dated Marh 15, 1910. Extension ladder having best locking device on the market. Also adjustable joint for fruit picking. Address, J. Austin Johnson, Hampton, N. H. sep

FOR SALE or on royalty—U. S. Patent No. 931,529. Convertible boat and tent. A very practical article for the army and sportsmen. If interested, address, Mr. Joseph Vaghi, Bethel, Conn. sep

FOR SALE—Patent No. 950,840, issued March 1, 1910. Draft Equalizer. For full particulars address, Frank Clark, R. No. 2, Marshall, Okla. sep

FOR SALE—Outright sale of patent No. 953,556 on padlock, patented March 29, 1910. Address, W. A. Shanks, Box 213, Wolcott, N. Y. sep

FOR SALE or on royalty—Patent on ladies' toilet and ornament; can be sold by mail, through agents or by the usual way. Easy terms. Address, R. Daboul, Box 329, Lawrence, Mass. sep

FOR SALE—Patent stove pipe and flue cap fa tener. A quick-selling money-making necessity. Outright sale preferred. Write me for particulars. J. Ed. Lang, 1115 Fulton Ave., Evansville, Ind. sep

FOR SALE—U. S. Patent No. 958,511, dated May, 17, 1910, for improvements in latch mechanism for split stocks and dies. Address, R. E. Leach, Cobalt P. O., Care O'Brien Mine, Ontario, Canada. sep

FOR SALE—Patent No. 950,195, dated Feb. 22, 1910. Automobile and carriage extension seat. Will sell state, county or U. S. rights. Address, I. S. Sturtevant, Center Harbor, N. H. sep

FOR SALE on royalty—U. S. Patent No 949,694. Brush Cleaner for Carpet Sweepers. Address, Armor & Collner, St. Petersburg, Pa. aug

FOR SALE—Patent No. 945,762, granted Jan. 10, 1910. Folding Harness Support. Folds automatically as soon as harness is removed. Write for particulars, William W. Dieleman, Lost Springs, Wyoming. aug

FOR SALE—Patents Nos. 916,868, dated March 30, 1909, agricultural implement; Patent No. 911,983, dated Feb. 9, 1909, belt replacer; and 911,876, dated Feb. 9, 1909, cultivator. Inventions also covered by Canadian patents. Will consider proposition for royalty, or will exchange for land and part cash. For further particulars address. John Horinek, Atwood, Kansas. aug

FOR SALE—Patent No. 888,394. A spoke-setting machine adapted for repair work. Can be used in factory. Is accurate and a labor-saving device. Will sell reasonable. Address, E. E. Foxworthy, Flemington, Mo. aug

FOR SALE or Trade—Patent No. 952,154. Lace Curtain Pole. Curtain held in position without rings or pins. Ornamental as well as useful. Will sell outright or part cash and royalty. Address, W. L. Thurber, Shellrock, Iowa. aug

FOR SALE—Patent No. 946,418, dated January 10, 1909. Combination switch and lightning arrester. This is the best invention of the age for use on telephones. Will sell for part cash and balance on trade. Address, Wood & Thoma, Lookeba, Okla. aug

FOR SALE—Patent No. 932,806, Aug. 31, 1909. Collapsible Box. Can be used for egg cases, fruit cases and boxes too numerous to mention. Will sell same at a reasonable price. Address, Oscar A. Paulson, River Falls, Wisc. aug

FOR SALE—Patent No. 648,231. Pruning Implement. Especially adapted for picking the brown-tail moth nests. Will sell outright. If interested, address, Charles I. Libby, R. F. D., Sanford, Maine, aug

WANTED.

WANTED—to correspond with patent owner or manufacturers of articles suitable for growing mail order business. Address, W. U. Ramershofen, Muirhead Building, San Francisco, Cal. oct

WANTED—Help to organize and promote a company to establish small mills in timber sections to manufacture material for my patented Veneer Barrels. Have an export and domestic trade using 800,000 barrels annually. Address, George H. Brown, 295 Duke St. Norfolk, Va. jan

WANTED—Agents wanted to sell Clark's Fly Exit. Lets flies and mosquitoes pass out of the house. Can be attached to any screen. Address, L. W. Clark, Cartersville, Mo. sep

WANTED—Financial assistance in protecting and exploiting five inventions having originality and merit which will commend them to the countries of the world. Liberal interest will be given in the patents to be procured in exchange for the capital necessary for the making of models, incidental and other expenses. For full particulars address, John Horinek, Atwood, Kansas. aug

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Caveats Abolished.

The attention of our readers is called to the notice appearing in another portion of thie paper, of an amendment to the patent laws repealing section 4902, relating to the filing of caveats. Commencing with July 1, 1910, no caveat can be filed in the United States Patent Office, and inventors who previously filed caveats will now have to apply for patents.

We were not in favor of this action of Congress, as we believe that there is a sufficient demand for caveat protection to justify its retention. Of course large manufacturers do not file caveats, and as a rule caveats are only sought for by men of moderate means. Plainly it was the influence and advice of attorneys and others who did not care for caveat protection themselves which brought about the repealing of this section. We have heard some attorneys say that they have not filed a caveat for fifteen years. The reason in their cases was because their clients are usually men of means, or large manufacturing concerns, who could afford the expense of a hasty and defective application for patent.

Hereafter, when an inventor conceives an idea, he will have to do either one of two things: work on it secretly until he has perfected the invention, or write out a description and make a drawing of the invention and then go before a notary public and make an oath that the invention is his own. By adopting this action he will have evidence in his possession that on the date he made the oath, he had conceived the invention and was working to complete the same.

It is a difficult thing usually to prove conception of an invention. Ordinarily when a man conceives an idea of an invention, he talks of it to his co-laborers, or friends, and the latter not being versed in mechanical matters, and not fully comprehending the invention, either forget about it, or retain a hazy recollection of it, and when the time comes to prove the conception of the invention, as when an interference is declared, the inventor finds that the parties to whom he disclosed the invention cannot remember the date when the disclosure took place, and have even a more indefinite recollection of the invention itself.

Under the caveat section of the patent statutes, a man could disclose his invention to the Patent Office by filing a caveat, and then upon the declaration of an interference, he would have proof within the Patent Office to establish the date of conception. Now that the caveat section of the patent statutes has been abolished, other means will have to be resorted to by inventors to prove the dates when they conceived their inventions. We have already suggested one way of doing this. Another way is to write to an attorney as soon as an invention is conceived and have a preliminary examination made. Most attorneys keep correspondence of this character for all time, and if an interference should result, the records of the attorney could be made use of to show the date when the correspondence with the inventor took place.

Another excellent plan to follow is for the inventor to keep a diary after he has conceived an invention and note therein the successive changes made in the invention from time to time. Then when the inventor is called to the stand to testify, he can produce his diary for the double purpose of refreshing his recollection and at the same time fixing the dates of conception and disclosure. If the inventor is a married man, he may safely disclose his invention to his wife, for under the present practice a wife can testify in behalf of her husband in an interference controversy.

The first thing to establish in an interference controversy is the date of conception of the invention, and any means that may be adopted to keep this point fresh in the minds of those who must testify on the subject, should be resorted to. Inventors must give closer attention to this in the future than they have in the past, owing to the fact that the caveat law is no longer in force.

Foreign Patent Laws.

The value of the protection of industrial property is so well recognized that all countries of commercial importance, with one exception, have definitely established patent and trademark laws. This exception is Holland. In that country, any person can copy anybody else's machine or invention without restraint, and can manufacture and sell it in opposition to the inventor. In fact, there is no such thing as the protection of an invention of any kind in the Neitherlands. Furthermore, there is no copyright law, so that the writings or books of all Dutchmen and foreigners alike can be copied and published without restriction. Trademarks, however, can be registered and protected the same as in other countries.

According to report, the situation is not as serious as it might appear. The population of the country is only five and a half million, or a third larger than that of the city of New York. The Dutch, also, are not a manufacturing people. When a foreigner patents an article in other countries, he generally floods Holland with his wares at a low price, so as to prevent any one establishing a mill to produce the goods in Holland. That is the only way open, and thus the people of the Netherlands get a number of things for less than the rest of the world pays for them. In these days of high prices, that would seem a good place to live.

No other civilized country, however, occupies such an exceptional position, geographically and economically, and the necessity of patent protection is universally felt. The patent obtained in Germany extends to its various colonial possessions, but the British patent covers only Great Britain and Ireland, and all the British colonies, from India down to the Gold Coast, have separate patent systems. British colonial patents are also quite expensive. The various possessions of England in Africa, not only in South Africa, but those on the East and West Coasts, require independent patents. The government charges are very high in some of these little colonies; indeed it would seem in many cases that the smaller the colony is, the larger the fees. China has no regular patent law, but Japan has included this among the other features of western civilization she has adopted. The one notable difference is in her treatment of trademarks. Applicants are entitled to use a trademark, in that country, not only for the articles they have worked upon, but for articles they have dealt in, so that owners of trademarks on articles that are intended to participate in the trade of the Far East would do well to file application for protection promptly. The colors used in trademarks are also protected in Japan. The Russian patent extends to Siberia, and all the countries of South America have well defined patent laws.

Employers' Liability.

America has the unsavory distinction of being more wasteful of human life than any other civilized country in the world. Our industries roll up a greater list of casualties than would occur under a widespread and perpetual war. If fifty thousand people were killed and half a million injured in a single year in any community, the world would stand aghast, and disasters like those of Messina would pale into insignificance. There would be Hague tribunals to stop the slaughter; but although the loss and suffering are as great under present conditions, the public shows an amazing indifference. "If I produce a device to save time," said a clever inventor, "I can sell it readily in a dozen places; but if I offer an idea for saving life, I cannot dispose of it at all." Great piles of refuse surround every factory where useful articles are made. The manufacturers employ expensive chemists to determine whether these wastes may not be utilized, and thousands of dollars are spent in the search for economy. But to the human waste nobody pays any attention. Like the culm and slag, it is left to mar the landscape. The scrap heap of life and limb is not worth bothering about, for do we not get each year more than a million immigrants to take the place of the workers killed or injured?

Our complex modern life is beset with artificial perils. We build higher and faster. We burrow under rivers and mountains; we find new and more powerful explosives daily; we use more and more chemicals that liberate noxious gases, we make new applications of electricity, with all its subtle dangers. We are constantly inventing perils of which our fathers never dreamed.

The figures of railroad casualties, given out from time to time by the Interstate Commerce Commission, attract newspaper thunder and the lightning of popular indignation. But constant iteration makes us grow accustomed to them. As a railroad man remarked "When soldiering is as deadly as switching, international disarmament will be at hand." But switching is only one of the perilous duties of the railroad worker. Statistics show, too, that it is twice as dangerous to work on the railroads now as it was 18 years ago. The present average is 30 killed and 250 injured every day in the year, and the ratio is increasing in spite of compulsory automatic couplings and other scientific safety devices. Traveling by rail is also becoming increasingly dangerous. Investigation of the cause of a terrible wreck near this city, last year, showed that the engineer had had only eight hours sleep out of the previous fifty-seven.

The same reckless disregard of human life is found in the mines. Two thousand men lay down their lives every year, and four thousand suffer injury, in order that our homes may be heated and our industrial needs supplied. This is the record for coal producing alone, and there are other mines that are quite as dangerous. It is safe to calculate the total loss at double the above figures.

Data as to manufacturing accidents are wanting. Terrible as they are, they have never attracted much attention, for it is nobody's business to collect and publish them. Only one state—New York—has ever made a serious effort to secure figures, and these were confessedly incomplete. There was everywhere a disposition to conceal casualties; but it is estimated that industrial accidents cost the nation at least double its annual fire loss, which now stands at about one hundred and seventy-four million dollars. For it is not the lives of ignorant and helpless foreigners that are involved here. These are men in early middle life, trained and experienced hands. And this is regarding the question only on its economic side, with no reference to moral responsibility. Every year thousands of wage earners—men, women and children—are caught in the machinery of our record-breaking production and turned out hopeless cripples. Thousands more, as has been shown, are killed outright. But we are too busy to count the dead, or consider the injured.

The fly wheel is more deadly than any shrapnel ever rammed into an artillery breach. The risk of exploding boilers is even greater. Our marvelous construction work takes heavy toll of life. Forty and fifty story sky scrapers are rising in our cities, and their building involves continuous spilling of blood. It begins with quarrying the stone, mining the iron, making the steel beams, excavating the foundations and sinking the caissons, and goes on until the steel is riveted into its audacious frame in the clouds.

Statistics for such perilous trades as dynamite and gunpowder making and handling are not forthcoming; nor for lumbering and diving. Many odd trade diseases were brought to light by the recent efforts of the bureau of labor to investigate the relation of occupation to health. There are miners' asthma, polishers' itch, and brassfounders' ague. Eczema attacks the skins of those who are employed in the manufacture of quinine. Men who make barometers and thermometers, suffer from salivation, due to the handling of the mercury. The teeth of those who prepare matches decay, and their jaws swell. "Naptha intoxication" disables many employes in the dyeing and cleaning trade, and also in the rubber industry, the symptoms being dizziness, nausea and headache. Carbonic acid gas occasionally suffocates well sinkers, and is also held responsible for a form of anaemia and debility peculiar to brewers, wine makers, distillers and yeastmakers. Manufacturers of bromine, widely used in photography, suffer from asthma and general weakness. "Grinders' rot" is a term applied to a form of consumption frequent in grinding and polishing departments of the cutlery and tool industry, where dust is inhaled from the metal as well as the grindstones and emery used. Stonecutters, especially those operating pneumatic tools which create clouds of dry dust, suffer from a like malady. "Green sweat" is a phenomenon manifested by bronze workers. Lead colic and "wrist drop" attack employes in ore roasting plants, painters, potters, plumbers, etc. Millers, who constantly inhale flour dust, show the highest pneumonia death rate, and bakers are subject to the same peril. Special forms of palsy afflict gold beaters, lapidaries, barbers, woodsawyers, clothing cutters and others whose daily toil compels them to use one particular group of muscles to excess. Men who handle hides and wool are sometimes infected with terrible diseases peculiar to the lower animals. Rag pickers have contracted the deadly sheep scourge, anthrax, in this way. Scores of such insidious maladies lurk in the work room, and although some are inevitable, many could be prevented by the proper use of industrial hygiene and safety appliances. A model establishment of this character is offered by Uncle Sam, in his great printing office, the largest in the world, with some five thousand employes. There are devices for changing the air in each room, every ten minutes, and for carrying off the poisonous fumes from the electrotype foundry. Isolated efforts are being made by employers to better conditions for their men, but there is need of a general awakening of popular interest in the question, which would lead to state legislation. Workers in mineral dust can have their lungs protected by the spraying of water over the article being ground. In the steel foundries of Massachusetts, which state is taking the lead in remedial measures, operators are provided with helmets protecting the eyes and nose from dust, and those in lead works wear respirators. But this country as a whole is far behind Europe in its attitude toward this vital question. When the British Home Office suspected coal dust of causing explosions through catching fire from the flash of common blasting powder, it hired an old mine shaft and conducted experiments that proved this to be a fact. And forthwith the use of common black powder was abolished in all mines, and non-flashing high explosives insisted upon in their stead. Of course the owners protested, for it meant an extra outlay of hundreds of thousands of dollars every year. But their struggles were in vain. Life—even the life of the humblest—is a sacred thing in the older nations. And workshop and factory inspectors see to it that a host of regulations are carried out in all industrial establishments. The significant motto of the German Government is "Better a fence at the top than an ambulance at the bottom." But the most adequate remedy, which embodies within itself the seeds of prevention as well as cure, is found in some form of workmen's compensation for all accidents. Ours is the only great industrial nation where there is not some form of employers' liability.

In Massachusetts, a few years ago, a commission, after long study, arrived at a proposed bill very similar to that now in operation in England. It was defeated by the "business interests." Then Illinois appointed a commission to investigate the subject and draft a new law. The proposed bill included nothing that was not in successful operation elsewhere. It was defeated by the business interests. The same influence has prevented action in New York. Nevertheless, we are making slow progress. The hard fight in Congress for a Federal employers' liability law has given place to a hard fight in the courts. Pennsylvania, which had a positively Pagan liability law, now has legislation which puts the state almost where England was a generation ago. Missouri has shown us what it can do by passing a whole series of acts, from factory inspection to raising the the maximum amount of damages for contributory negligence of employers. We hope that the census now being taken will cover an inquiry into the extent of industrial accidents, and that this in turn will lead to legislation that will place us abreast of the most progressive nations in this matter.

Copper Coated Steel.

Electrical transmission of energy by the overhead system, whether for street railway, telephone, electric lighting or power purposes, requires the use of wires or cables of high conductivity, to avoid heavy losses of power that would result from an attempt to overcome the resistance to the passage of the current in metals that are poor conductors. Copper is one of the best known conductors possessing non-corrosive qualities that are valuable, but copper is expensive and lacks tensile strength. For economic reasons, tensile strength is a most desirable quality for metals used for line work, while low cost is of course of prime importance. Steel possesses both strength and cheapness, but is low in conductivity and rusts quickly when exposed to the elements. Foreseeing the value of the combination of the desirable qualities of these two metals, inventors and metallurgists have made various attempts to effect a process of coating steel wire with copper. The first attempt consisted in depositing copper on steel wire by the electrolytic process, and one of the telegraph companies spent a great deal of money in constructing lines of this electroplated wire. It was discovered, however, that the deposited copper was porous and too soft to withstand mehanical abrasion, while the manufacturing process left a film of acid between the copper and steel which attacked the steel and caused it to separate from the copper coat. These partial failures, says the *Technical World*, convinced a French scientist that the two metals must be welded together homogeneously, and he set to work on the problem. He achieved satisfactory results by first cleaning a steel billet six inches in diameter by thirty-six inches long and welding upon this, at a high temperature, a thick coating of soft copper. The bolt is then reheated and put through ordinary rolls. The resulting wire is sent to the drawing mills and drawn into wire of any size.

By this process, the union between the two metals is perfect, and leaves no chance for acid or air to find place between them. The cohesion is so strong, it is impossible with a hammer to break a section of the copper ring away from the steel core of a section sawed from the billet before drawing. Metal sheets for many commercial and industrial purposes can be made by this process by welding a copper coat to a square billet and then rolling the latter into flat sheets of any thickness. The proportion of copper to steel is only ten per cent for ordinary structural work, where the non-corrosive qualities are the chief desideratum. But for electrical work, the proportion is increased to give conductivity of 30, 40 or 50 per cent of that of pure copper. Not only can steel be coated with copper by this process, but with any other metal or composition desired, such as brass, silver, gold or platinum. The method is a simple and inexpensive one. Copper clad wire can be made on a commercial scale to sell at a price about one-third less than the copper product of the same kind. This is not, however, the only economy. Because of the greater tensile strength of the bimetallic wires, a wire of smaller gage and consequently lighter weight can be used for a given purpose, such as a telephone or telegraph line, and the supports can be set further apart.

In the electric transmission of water power, in which field line construction and maintenance are the greatest items of expense, the high tensile strength of the copper clad wire makes it possible to greatly reduce the number of towers or conductors. Owing to its non-corrosive qualities, it can be substituted for galvanized iron wire, which is used to a large extent for short line telegraph and telephone work, with considerable saving, since the copper clad wire would need renewal only once in 15 years. The iron wire would have to be taken down and replaced twice in the same time. The same quality is also of special advantage in strands of twisted cables for all kinds of mechanical power transmission. Each strand is thoroughly protected. Another quality of advantage here is the reduction of friction between the strands when the copper runs over pulleys. This is due to the well understood molecular characteristics of the copper, which permit it to slide on itself with less friction than steel. Many other applications of the metal can be made. For instance, copper steel wire nails can be driven into the planking or trimming of boats, without first boring holes for them, as has to be done for pure copper nails, so that they will not bend under the blows of the hammer. Carriage and automobile springs made by this process will not rust between the leaves, and the leaves slide more freely upon one another. Copper clad steel shells for projectiles can be drawn up to any size with only one or two annealings, and will stand rough handling and transportation, while brass has not sufficient strength and splits when attempts are made to form it into shells of larger diameter than four inch bore. Furthermore, cartridges made of the double metal can be stored indefinitely without deterioration of the powder, while brass has a deleterious effect upon smokeless powder that prevents the manufacture of any considerable quantity of ammunition in times of peace, and necessitates hurried work and consequent poor quality when war is imminent. Copper cornices, screens for doors and windows, rigging for ships, in fact any application in which the various qualities mentioned are desirable, as for culinary utensils, wash boilers, etc., can be wrought to advantage from the metals made by the new process.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Chairs, Blower for rocking....E. G. Bules
Chalk-sharpening device.....A. Brantz
Check, Baggage-.....J. M. Bailhache
Check-hook.....H. E. Lntz
Checkrein-holder.....G. A. Stanton
Chimney-draft, Device for varying.....H. T. Trautmann et al
Chimney protector or shield..T. J. Canivan
Chuck, Automatic pnenmatic...N. M. Doen
Chuck, Tool.....J. S. Fray
Churn.....W. S. Pettit
Churn.....S. M. Hopkins
Cigar-tip cutter.....T. F. Pryor, Jr.
Circuit-breaker.....C. T. Henderson
Circuit-breaker, Automatic.C. T. Hentschel
Circnit-breaker-retarding device.....C. E. Eveleth
Circuit closer or timer.....W. J. Rapp
Circuit-controlling device, Automatic.....W. C. Yates et al
Circuit make-and-break device.....J. E. Scovill
Clamp-press.....W. D. Osborn
Clasp.....W. T. Blasdell
Claw and pinch bar, Combinatiou.....M. S. Clarke
Clock, Electric alarm.....H. C. Wilcox
Cloth-piling machine...3 pats.....C. Weiss
Clothes-pounder.....M. J. Baker et al
Clutch.....L. Wirtz
Clutch, Combined frictional and positively locking.....A. Latham
Clntch mechanism.....J. F. Dnryea et al
Cock and train-pipe connection, Angle....M. A. Garrett
Coin-operated lock.....H. F. Chreitzberg
Collar-guide.....M. Tillie
Compass.....W. L. Murphy
Comptometer-hand.....S. B. Lamkin
Concrete building constructions, Form for.....G. F. Fisher
Concrete, Reinforced.....P. B. Noyes
Concrete sleeper, Reinforced.....H. Groger
Concrete veneer for building construction, Metal-reinforced.....A. Schnurr
Condenser, Surface.....L. B. Alberger
Condensing fluid substances...2 pats.....A. G. Kalb
Condensing plant and air-pump, Steam....W. Weir
Cooling apparatus for fluid or semi-fluid snbstances.....E. Schou
Coop, Folding poultry...R. Trnmpold et al
Coop or crate, Folding..R. Trnmpold et al
Copper matte and ores, Treating impure...H. Maschmeyer
Copy-holder.....B. F. Peetz
Core, Collapsible.....C. C. Crossley
Corn-crib.....C. M. Rowland
Corset-cover and bust-snpporter, Combined.....J. Marx et al
Cosmoscope.....J. E. Williams
Cotton-pickers, Split-lap preventer for....H. R. Whitehead
Coupling.....E. Marek
Crate, Folding.....A. J. Parmeter
Cross-slide-operating mechanism.....H. B. Lester
Cross-tie, Metallic.....W. E. Cole et al
Culinary utensils, Alarm device for.....P. C. Emslie
Cnltivator.....J. P. Meyers
Cnltivator attachment.....C. Sell
Cnltivator attachment, Swivel-action.....J. T. Foulke
Cnltivator, Hand.....E. Piggott
Cnrrent-controller.....B. H. Parker
Cnrrent-motor.....T. J. Steele
Cnrrent motor, Alternating...2 pats.....V. A. Fynn
Curtain-fixture...2 pats.....H. E. Keeler
Cutting-machine.....J. H. F. Clifton
Cylinders, Making toothed...E. J. O'Brien
Cylinders, Pressnre-eqnalizing mechanism for.....G. W. Nistle
Dashboard, Vehiele.....J. F. Jaqnet
Decanting oils and liqnids, Tilting appliance for.....P. T. White et al
Decoy.....C. A. Cunningham
Dental cuspidor.....I. M. Hair
Dentistry, Impression-tray for.....M. M. Kerr
Derrick.....J. McVeigh
Desk.....I. M. Tindall
Desk and seat, Combined school.....T. Kundtz
Disinfectant-holder.....C. J. Walz
Display-case.....D. S. Forchheimer
Display-machine.....J. S. Anderson
Distilling apparatus.....G. Laczay
Door-closer.....H. J. Wentz
Door, Grain.....A. A. Kramer
Door-operating means, Sliding..P. Wheeler
Door-operator, Electrie.....T. Nakahara
Door-stop.....E. Vanoni
Dongh-molding machine.....F. Streich
Draft-eqnilizer.....J. Van Matre
Draft-evener.....G. I. Bristol
Drag, Horse.....W. C. Braun
Drift-bolt puller.....J. A. King
Drinking-cup, Collapsible.....M. Sholl
Drinking vessel, Prophylactic..J. L. Sowell
Driving connection, Flexible..S. M. Vauclain
Dyeing-machine.....J. Richardson et al
Dynamo-driving.....W. I. Thompson
Egg-box.....C. B. Klefeker
Electric battery.....F. A. Decker
Electric cable.....R. F. Hall
Electric furnace.....H. W. Hixon
Electric generator and motor.C. T. Hibbard
Electric heater.....J. C. Logan
Electric machine, Dynamo.J. E. Noeggerath
Electric machine, Dynamo..W. D. Pomeroy
Electric meter.....C. E. J. O'Keenau
Electric rosette.....J. S. Crossley
Electric switch.....E. M. Coffin
Electrical distribution system.....W. A. Turbayne
Electrical distribntion system.....W. E. Winship
Electrical purposes, Coil for..E. W. Jodrey
Electrically-heated roller.....G. H. Wade
Electricity-meter, Prepayment...2 pats.....H. Aron
Elevator.....W. Renbold
Elevator freight-compartments, Door attachment for.....B. Snyder et al
Elevators, Interlock mechanism for.....J. S. Muckle
Engine primer, Gas.....L. R. Dalrymple
Engine starting and stopping mechanism, Internal-combustion.....J. B. Polo
Ester for chaulmoogra-oil.....L. Taub
Excavator.....H. F. Menck
Explosive.....C. P. H. Claessen
Extension-table.....R. M. Miller
Extension-table.....K. Kral
Extension-table.....J. B. Weeks
Eyeglass-mounting.....T. Rapp
Fan, Ventilating.....R. A. Ilg
Fastener for gloves and other articles.....L. W. Brown
Faucet.....C. T. Brown et al
Faucet for drawing liquids.....G. Wegman
Feed-water by exhaust-steam from steam-engines, Apparatus for heating.....J. Kerfoot
Fence-post.....J. M. Campbell
Fence-post.....C. T. Howell
Fence-wire clamp.....T. M. Cadle
Figure, Jointed.....G. W. Ferguson
File-cabinet, Rotary.....C. and W. Liebert
Files and rasps, Machine for producing...G. Peiseler
Filing-cabinet.....S. Klepfer
Filter-bag.....E. P. Dargin
Filter, Vacuum.....M. E. Hiltner
Filtering apparatus.....D. J. Kelly
Fire-escape.....M. F. Welch
Fish-net.....D. P. Gilstrap
Flagstaff.....M. Hendricks et al
Flat foot, weak foot, or fallen arch of the foot, Device for the correction of.....F. C. Schumacher
Fluid-pressure motor.....H. B. Holt
Flnid substances, Disiccating...2 pats.....A. G. Kalb
Fly-gnard.....P. Kreuscher
Flying-machine.....W. W. Christmas
Forming-machine.....G. H. Petri
Furnace-arch construction.....C. Campbell
Furnace-feeder.....L. P. Bolander
Furniture, Article of.....J. A. Ward, Jr.
Furniture-support, Adjustable.....G. E. Anderson
Gage...4 pats.....J. M. Leaver, Jr.
Gambrel, Hog.....J. A. Kaiserlik
Game apparatns.....A. W. Proctor
Game apparatus.....J. R. Snow
Game apparatus.....D. C. Mitchell
Game apparatns.....E. J. Burke
Game-board.....H. A. Richardson
Games, Artificial playing-bed for open-air.....J. H. Stedman
Gapped wheel.....W. T. Sears
Garbage-receptacle.....S. Moorman
Gas-bnrner.....E. Meyer-Zimmerli
Gas-burner, Antomatic.....R. G. Jamison
Gas-burner eontrolling device.....J. V. Wengelin
Gas generator, Acetylene...O. W. Peterson
Gas generator, Acetylene.....S. A. Miles
Gas-light, Inverted ineandescent.....A. E. Shaw
Gasolene-engine.....E. Vanderlip
Gate.....C. M. Clark et al
Gear, Reversing.....D. W. McLaughlin
Gearing.....P. Gaeth
Gearing, Transmission.....W. M. Parkison
Gin-pole.....W. R. Kales
Glass bottles, jars, and the like, Machine for manufacturing..F. W. Knowles et al
Glass-making machine, Wire.A. J. Baldwin
Glass, Method of and means for annealing.....F. Shuman
Globe for protecting mantles..A. P. Nelson
Gopher-exterminator...E. C. Duckett et al
Grader, Road.....T. E. Lyon
Grate-bar, Rocking.....C. R. Kline
Grinding cams, Machine for...M. A. Thiel
Grindstone truing or dressing apparatns..S. King
Hair, Cnring.....G. E. Dyek
Hair curler and waver.....W. F. Freeman
Hair-grinding machine.....C. P. Bossert
Hammocks, Foldable stand for canopy....C. A. Berger
Harness, Casting.....I. Pasley
Harness-shield.....A. B. Harrell
Harrow, Adjustable cultivating.....W. S. Morgan
Harvester, Corn.....F. D. Wilson et al
Harvester-cntter.....N. P. Lithander
Harvester-entter mechanism...L. T. Velen
Harvesters, Elevator-hood for.E. C. Mottert
Hat-hrim edging, setting, and rounding maehine.....C. E. Sackett
Hat-fastener.....A. Straus
Hat-holder.....E. J. Guillard
Hay-press.....D. S. Beard
Hay-presses, etc., Condenser for.....L. B. Wygant
Hay-sweep, Self-dumping.....A. E. Davis
Hay tedder and mower....W. F. Schanzlin
Head-gate.....J. A. Taylor
Heat-insulated receptacle.....L. R. Steel
Heating running water, Apparatus for electrically.....G. Fuller et al
Hinge-joint.....F. Wetteroth
Hinge, Spring.....F. H. Ellis
Hitching device, Horse.....E. B. Rolfe
Hod.....G. W. Fross
Horn, Reverberatory sound.W. A. Chapman
Horse-releaser.....G. W. Huffman
Horsehoe.....G. Limbach
Horsehoe.....S. Orosz
Horsehoe-calk.....E. Huber
Hose.....R. H. Brown
Hose carriage, Garden.....A. Low
Hose coupling, Air.....E. W. Shaw
Humidifier.....J. W. Fries
Humidifier.....E. Maxwell
Hydraulic jack.....R. W. Baker
Impact-tool.....J. J. Padbnry
Implement, Combination.....C. J. Livering
Indigo and making same, Dichlor-dibrom..P. Jnlins et al
Inhaler.....W. S. Doane
Inking-ribbon winding apparatus..G. Bluen
Interlocking switch.....A. C. Savage
Internal-combustion engine...C. W. Higgs
Internal-combustion engine.....P. Daniel
Internal-combnstion engine.....N. Metz
Ironing-board.....J. A. Bean
Ironing-table.....J. McGnigan
Jig.....W. A. Bradley
Journal-bearing.....B. L. Morrison
Journal-box.....W. R. Buss et al
Key-locking mechanism.....P. H. Turley
Knitted sweater.....M. A. Mueller
Knitting or weaving device, Hand.....A. Pntnam
Knob and spindle fastening....C. A. Berry
Label cabinet and moistener....C. K. Resh
Lacing.....A. T. Holt
Lacing-hook.....A. Weigand
Lamp.....W. S. Ryan
Lamp, Gas.....A. Rector
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Lamp-socket attachment, Eleetric.....H. E. Plunkett
Lamp socket, Electric.....F. E. Seeley
Lamp socket for reducing the light, Regnlating incandescent.....E. H. Smith
Lamp-support, Resilient.....A. Woodley
Lathe-tool support.....C. L. Libby
Leather machine, Composition..F. Kukkuck
Level, Plumb.....A. A. Baumann
Leveler, Field.....G. M. Brand
Life-preserver and swimming-machine.....O. B. Lyon et al
Lifter.....F. W. Glymps
Lifting-jack.....J. M. Hawkins et al
Line-casting maehine, etc.W. G. Middleton
Line-casting machine.....J. R. Rogers
Link-forming machine.....J. F. Gail
Liquid-elevating mechanism.....M. J. Christensen
Liqnid-purifying machine, Centrifugal.....A. Ponten
Lock for windows and analogons devices...W. L. Deming
Locking device, Hasp.....E. A. Lindstrom
Locking means, Closnre...2 pats.....C. J. Ljnnggren
Locomotive-drive-hox adjnster.....M. F. Brennan
Logs of the like to hanling-tackle, Means for removably attaehing.....S. Ashdown
Loom.....H. Cote
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Loom picking-motion, Vertieal.....R. Abell
Magneto and battery switch for electric igniters, Combined..A. J. Stndnicka et al
Magneto-electrie generator.F. I. Remy et al
Mail-catcher.....S. G. Staymates
Mail-handling apparatus.....M. M. Miller
Mail-handling apparatns.....W. H. Hargraves et al
Malting apparatns.....C. J. Erdmann
Manure-receptahle.....J. Harrigan
Mast-cap.....B. D. Jensen
Master-eontrollers, Means for operating.....E. G. Deneher
Milling-machines, Feeding device for.....H. F. Kellemen

Medicinal compound, Making...A. Garicsan
Metals and the like from extraneons matter, Apparatns for separating.....R. M. Simpson
Mines, Removing coal from.E. O'Toole et al
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Mixing and blending machine.....H. G. Boughton
Molding-machine.....E. Killing
Motor control.....E. F. W. Alexanderson
Motor-driving mechanism.L. E. Underwood
Motor regulator, Pneumatic...T. Danquard
Motor-starter.....A. J. Burns
Motor starting device, Electrical.....H. Weiehsel
Mowers, Cutting mechanism for.....J. S. Lynch
Mowing-machine, Automobile..C. G. Denalo
Musie binder and carrier.....F. H. Duesler
Music turner, Sheet.....J. O. Phillips
Musical instruments, Automatic player for.....P. Welin
Net.....J. F. Masek
Nose-bag holder.....C. H. Thompson
Nut-lock.....L. D. Frenot
Nut-lock.....H. Robinson
Nut-lock.....C. F. Clawson
Nut-lock for screw-socket for well-drilling machines.....A. G. Martin
Oil-bnrner.....V. F. Lassoe
Ores, Treating...2 pats.....P. A. Emannel
Oscillographs, Film-holder for.....L. T. Robinson et al
Osteopathic tables, Swing for.W. E. Fogle
Oven, Baker's.....I. Slapo
Oven for tempering shoe-shanks and other small articles.....A. M. Moore
Oxidation of resistance-conductors, Preventing snrface.....J. T. H. Demster
Package-holder.....F. Goble
Padlock.....A. Nerhaft
Page-marker and music-leaf turner.....L. F. Suddick
Painting apparatus.....H. DuBrau
Paper-clip.....D. G. Galbraith
Paper-cutter.....L. F. Brening
Paper-eutting machine.....N. Gray, Jr.
Paper, etc., pliable, Making.....F. Evers
Parceling-machine.....J. Bardet
Pea-vine-hulling machine, Green.R. P. Scott
Pea-viue-hulling machine, Green.T. A. Scott
Peas on the vines, Maehine for hulling green.....R. P. Scott
Peat and the like, Drying apparatus for...C. A. Matheson
Pencil-holder.....W. Henrichs
Pencil-holder.....L. May
Penholder.....A. Beaty
Phonographs, Antomatic brake for.....W. C. Mills
Photographic-printing machine, Automatic.....G. W. Ferguson
Photographs or other pietures, Embossing..A. G. Scopes
Piano, Horizontal grand player.....N. D. Hosley
Piano-players, Tracker-board for.....M. F. Holderman
Pieture machine, Moving.....C. J. Paulson
Pillow-sham holder.....J. M. Babcock
Pipe-cleaner.....H. P. Stewart
Pipe fitting, Drain.....G. W. Berry
Pipe-threading dies, Self-centering work and die holder for.....E. L. Troup
Pipes, valves, etc., at fixed intervals, Apparatns for the automatic opening and closing of.....H. Jacobi
Pitman conneetion.....W. N. Parkes
Plaiting and bobbin machine.....M. Ebeling et al
Planter, Potato.....W. J. Yearsley
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Plastic sheet composition.....A. Thoma
Pliers or pipe-tongs.....G. L. Holt
Plow.....J. E. Thompson
Plow harrow attachment....W. H. Walker
Plow, Snlky.....W. L. Paul
Plug, Attaching.....H. R. Sargent
Plumbing attachment.....H. Phillips
Pneumatic motor.....T. Danquard
Poker.....W. L. Janwich
Pole, Vehicle.....G. J. Thust
Polishing-wheel.....S. A. Cochell
Potash salts, Recovering.....A. Alberti
Power-transmitting apparatus.H. L. Brown
Prepayment mechanism.....J. B. Kaighn
Pressure-gage.....C. J. Manning
Printing machine, Card.....M. H. Mann
Printing-plates, Producing.....E. Bassist
Projecting apparatus.....C. Dupuis
Proof-press.....W. G. Potter
Propelling boats, Means for..S. Giovannini
Propulsion of vessels, Means for the.....R. P. Nielsen
Pull-socket.....G. W. Goodridge
Pulley and attachment therefor.....C. A. Brinley et al
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Pnmp.....A. A. Parker
Pump attachment.....O. Nuernberger
Pump, Centrifngal.....R. O. Jones
Pump, Tire-inflating.....M. L. Bastian
Pyrographic point.....L. Quosbarth
Quilting-frame.....F. Jakob
Rail-clamp.....W. Berry
Rail-fastener.....D. Ashworth
Railway crossing.....P. P. Lewis
Railway-rail and joint therefor..J. Murphy
Railway-switch, Automatic...A. A. Moore
Railway-tie.....F. O. Blair
Railway-track eonstruction...J. W. Blower
Razor-stropper.....D. Millington et al
Reflector for light rays, Composite.....O. A. Mygatt
Refrigerator-ear-hatch closure....E. Posson
Regulating apparatus.....J. M. Dougherty et al
Rein-holder.....J. S. Brough
Rerailing-frog.....W. Martley
Ribbon-holder.....A. Morgan
Rocket.....T. G. Hitt
Rotary engine.....A. E. Rasmussen
Rotary internal-combustion engine.....J. S. Stewart
Roof.....A. Oesterheld
Rotary eompound steam-engine..C. R. Hilty
Rotary screen.....S. W. Traylor
Rubber heel.....S. Havens
Rubber, Producing.....H. O. Chute et al
Sack-holder.....H. B. Sackett
Sad-iron.....C. W. Amick
Safe, Wall.....C. E. Blechschmidt
Salt and recovering its impurities as by-prodncts, Refining.....C. Glaser et al
Salt, Refining.....C. Glaser et al
Sanding and rubbing machine..H. Westphal
Sanding-machine.....T. Nichols
Sash, Ventilating.....J. Benz et al
Sash-weight, Sectional.....J. M. Cornell
Scaffolds for flagpoles and the like, Traveling.....J. A. Olafson
Scrubbing-machine.....J. G. Webb
Seal, Water.....H. H. Dow
Scaling machine, Envelop.....H. K. Harris
Scparating-machine.....H. Hastings
Sewing-machine.....J. Combest
Sewing-machine attachment...M. E. Tynes
Sewing-machine feeding attachment.....R. K. Hohmann
Sewing-machine, ete., motors, Device for operating.....W. Lenhart
Sextant.....M. P. T. Smith
Shade-holder.....L. J. Castonguay
Shade, Window.....D. C. Harrison
Shaft-hook, Safety-holdback.....D. N. Hyre et al
Shaft-oscillator.....A. H. Wouters
Sheet-feeding machine.....F. L. Cross
Ships, Skylight and ventilating construction for.....J. Crates
Shoe-filler apparatus.....A. Thoma
Shoe-rack.....B. H. Birchall
Short-weft fabric and making the same.....D. F. Lucier
Show-case lock.....L. H. Sehmidt
Sifter, Automatic flonr.....G. McEachron
Sign.....F. W. Ruby
Sign, Electric.....E. J. Prindle
Sign, Moving.....W. W. Liles
Signing machine, Multiple...J. C. Gardiner
Siphon attachment for bathing purposes, Spraying.....R. D. Knickerbocker
Siphon-closet.....C. H. Christensen
Slate-pieker.....C. S. Farrer
Smelting-fnrnace.....J. Grogan
Smoke-consumer.....T. Rees
Snow-plow, Rotary.....W. H. Fergusou
Soap-cutting machine.....Z. G. Sholes
Soap-dispenser.....W. B. Garnett
Sodium aluminate, Making..P. A. Emanuel
Sodium sulfite and ammonium chlorid, Making.....R. Friedrich et al
Soldering implement.....H. J. Greene
Soldering-iron, Electric.....E. W. Rice, Jr.
Soldering-machine, Hand.....A. Tosco
Soldering-tool.....A. A. Bedard
Sole euttiug and marking machine.....M. Cook, Jr.
Sonnd-reproducing machine, Disk.....T. H. Macdonald
Sounds, Recording and reproducing.....J. C. English
Sower, Seed.....R. Schonner
Spark-plug, Oil-proof.....E. J. Bushey
Speed retarding and reversing device.....K. J. A. Isakson
Speedometer.....D. M. Bell
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Spinning-machine, ete., Stop-motion mechanism for.....O. Agel et al
Spinning-ring.....C. S. Forbes
Spinning viscous liquids, Machine for.....E. Elsasser
Spring trip mechanism.....J. C. Messer
Spring-wheel.....E. Schuyler et al
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Stair.....J. C. Toliver
Stalk-cutter.....J. Michalka et al
Stamp-affixer.....P. G. E. Daniel et al
Starting mechanism.....W. L. Terry, Jr.
Steel, Making hardened.....H. de Nolly
Stitching mechanisms, Presser-foot for shoe-sole.....H. Michelsen
Stoker for furnaces, Mechanical.....F. C. Armstead
Stopper-retainer.....A. C. Boggs, Jr.
Stove, Baking.....J. A. Coppridge
Stove-burner.....J. L. Park
Stove, Cooking.....E. Barker
Stovepipe-holder.....W. E. McCune
Stuffing-box, gasket, valve, and spring, Combined.....G. L. Kenuedy
Stuffing-rod.....O. Brookman
Suction-box.....J. F. King et al
Sulfur-burner.....P. H. Grimm
Swing, Gliding.....F. S. Spaulding
Tagging-machine.....F. W. Hall
Talking-machine.....R. L. Gibson
Tanks, Pneumatic pressure apparatus for water.....R. B. Carter et al
Tanning apparatus.....J. B. Koogler
Target, Moving.....P. Chiantore
Telegraphic keyboard transmitting apparatus.....P. B. Delany
Telephone apparatus.....C. F. Bradburn
Telephone apparatus...2 pats.....C. F. Bradburn
Telephone-mouthpiece.....A. Bebout
Telephone-receiver.....N. Baldwin
Telephone system.....C. F. Bradburn
Telephony, Transmitting system for space..V. H. Langhter
Tent-frame.....A. Juin
Thread-trimming mechanism..H. W. Slater
Tile-board.....G. P. Chappell
Tile-cutting machine.....J. Bensing
Tiling, Forming.....G. P. Chappell
Tiling, Forming ornamental..G. P. Chappell
Time-controlling mechanism..H. C. Wilcox
Tire-grip.....A. R. Corrington
Tire-sleeve-fastening apparatus.....P. B. Donahoo
Tires, Protecting-cover for pneumatie.....A. Constantin
Titanium-nitrogen compounds, Production of.....C. Bosch
Toilet-seat, Collapsible.H. B. Vanosdall et al
Tool.....C. C. Taintor
Torch, Vapor.....T. Yates
Torpedo.....M. Glass
Tow-lines, Surge-reliever or safety device for.....W. A. Duncanson
Toy.....G. H. Ulbrich
Traek, Elevated.....J. C. Fitzgerald
Track-sander.....C. P. White
Tracker-board, Universally-movable.....M. F. Holderman
Transmission system.....J. Schlig
Tree-felling machine.....J. E. Wise
Trolley-guard.....F. B. Wagner
Trolley-wheel.....O. S. Chew
Truck, Barrel.....C. Bjorklund
Truck, Lumber.....E. B. Merry
Trucks, Basket attachment for barrel.....C. Bjorklund
Trunk.....C. A. McCarthy
Truss-bar.....P. E. Bertin et al
Tube-bending machine...2 pats..J. F. Gall
Tube-mill.....B. L. Morrisou
Tunneling-machine structure...J. P. Karns
Tunnels, Smoke-exhausting device for.....P. H. Wedmark
Turbine, Multistage.....F. Hodgkinsou
Turbo-generator, Direct-current.....E. C. Wright
Twine-holder.....C. E. Layman
Type-writer back-spacing mechanism.....H. Raymond
Type-writing machine.....E. E. Barney
Type-writing machine.....H. H. Steele
Type-writing machiue.....O. Woodward
Type-writing machine.....F. A. Young
Type-writing machine.....C. B. Yaw
Type-writing machiue.....W. C. Paul
Type-writing machine.....H. Crutchley
Umbrella, Folding.....G. V. Bratzel
Umbrella part.....F. Wetteroth
Undergarment for womeu.....M. Millard
Vacuum-supporting device..F. P. Schroeder
Vacuum-trap.....L. P. Strong
Valve.....C. A. Ellis
Valve.....E. E. Sweet
Valve.....E. P. Allen
Valve.....C. E. Strong
Valve-chamber for water-columns.....F. C. Anderson
Valve, Distributing and reversing expansion.....W. M. Coward
Valve for internal-combustion engines.....F. W. Brady
Valve for steam-traps.....C. J. Mackerey
Valve for steam-traps and the like.....C. J. Mackerey
Valve, Gas-engine.....R. White
Valve, Irrigating.....E. E. Izer
Valve motion for steam-engines, Slide.....E. Frikart
Valve, Piston.....J. T. Wilson
Valve, Pressure-eontrolling..F. A. Lockwood
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Valve, Stop and check...G. C. Davis et al
Vaporizing device.....A. A. Low et al
Vegetables and partially cooking the same, Washing.....E. J. Judge
Vehiele-brake.....V. T. Sweeney
Vehicle driving mechanism....J. F. Waite
Vehicle wind-shield...H. W. Bertram et al
Vehicles, Folding hood-framing for road...P. W. Watson, Jr.
Vending-machine, Coin-operated...J. Starr
Ventilator.....L. Johanns
Vessels, Apparatus for locating suuken.....G. B. Lea Quee
Violins and similar stringed musical instruments, Keyed finger-board for.A. T. John
Vise.....E. C. Stearns
Voting-machine.....W. Glenn
Wagon-jack.....M. G. Colby
Wagon-rack, Detachable.....J. Weber
Walls, Apparatus for building retaining...F. M. Talbot
Washing-machine.....W. H. Preston
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Water-heater.....H. T. Raser
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Wells, Electric heater for oil.....O. B. Linquest
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Windage losses, Means for decreasing.....J. E. Noeggerath
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Wire-drawiug dies, Cooling attachment for.....J. A. Horton
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Writing machine, Check.....G. M. Barker
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Clothes-raek.....C. D. Golden
Fabric, Textile.....D. E. Bonner
Glass vessel.....A. J. Sanford
Rng.....A. Petzold
Spoon.....G. Strohhaker
Spoons, forks, or similar articles, Handle for.....W. C. Codman
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Album for holding disk records.....T. W. Wright
Alfalfa-meal mixer.....W. H. Kissel
Animal-trap.....P. J. Kottum
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Automobile turn-table bearing and making the same.....W. A. E. Noble
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Bed-bottom.....W. A. Manchee
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Binder, Loose-leaf.....W. S. Proudfit, Jr.
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Bituminous structural material.....H. R. Wardell
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Boilers, Apparatus for cleaning fire-tubes of.....M. Domiszewski
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Book, Combination fashion and sample.....H. E. Bodine
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Boot and shoe ironing and dressing jack.....T. G. Plant
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Brake.....H. Vanderbeek
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Bucket, Self-closing bottom-dumping.....R. N. Schalkenbach
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Building-block, Interlocking cellular.....L. Ribereau y Marteaux
Building-blocks, Molding artificial stone...A. O. Thomas
Built-up die.....J. H. Ames
Butter-cutter.....W. P. Hart
Button.....S. J. Serwer
Button, Cuff.....R. N. Brothers
Cabinet, Information and directory.....E. A. Ovenshire
Cabinet, Lace.....J. H. Adkins
Cable-carrier apparatus.....G. A. Amsdeu
Calendar.....W. G. Fairchild
Can-capping machine.....F. Seitz
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Candelabrum.....O. H. Van Guelpen
Candy scouring and eleaning machine.....W. F. Walker
Cannon.....E. J. Blood
Canvas-cementer.....T. G. Plant
Capping-machines, Clutch for...L. Bartlett
Car, Convertible box.....J. A. Ansley
Car-coupling...2 pats.....S. P. Bush
Car-eoupling-operating device...S. P. Bush
Car-fender.....C. P. Bronson
Car-journal, spongiug-shield, and oil-saver.....L. E. Keller
Car loader, Railway-box....H. L. Jackson
Car sliding grain-door.....F. C. Lakin
Car, Spliced-side gondola.....S. Otis
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Cash-register..... F. H. Trevelian
Casing-wrench, Combination.. W. L. Dunn
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Chain..... J. M. Dodge
Chain construetion, Drive.... W. J. Belcher
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Cigar-banding machine..... ..... J. J. and T. E. Fearon
Cigar-cutter..... A. Emrich
Cigar-cutter forming part of a combination tool..... H. A. Chippendale
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Clock-synchronizing attachment..... ..... B. F. Merritt
Closure..... C. D. Love
Clothes-line holder..... A. Heinzinger
Clothes-pin..... G. S. Pollock
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Coffins, Attachment for.... U. H. Deering
Coiling and feed mechanism.. F. H. Richards
Coin-actuated mechanism.... E. S. Hagen
Coin-chute..... E. S. Hagen
Coin-controlled apparatus.. A. Gerstenkorn
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Coke-oven..... W. Mueller
Coke, Quenching..... E. Schulte
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Collapsible box..... J. M. and D. C. Jones
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Commutator..... H. T. Johnson
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Concrete pipe, Machine for making reinforced..... H. R. McMahon
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Corn and bunion plaster..... E. J. Ward
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Cross-head..... W. J. Wassmann
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Display apparatus..... E. F. Cannon
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Electric machines, Coil for dynamo..... ..... G. Chovan
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Eyeglass-monnting..... G. A. Bader
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Flooring, Seetional metallic..... ..... J. H. Striggleman
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Laying and leveling maehine.. T. G. Plant
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Leather-working die..... R. C. Schemmel
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Line-casting machine..... J. R. Rogers
Line-easting machines, Matrix for..... ..... R. M. Bedell
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Looms, Drop-shuttle-box mechanism of.... ..... E. H. Ballou
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Manifolding deviee..... E. J. Tousignant
Mantle-supporting transportation device... ..... T. J. Little, Jr.
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Milking-receptacle..... I. N. Horne
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Mining-machine..... J. C. Hirst
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Mustard-grinding mill..... P. Oehmig
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Oar-lock, Adjustable..... E. E. Matson
Oil-burner ..... C. W. Sievert
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Ore, furnace-dust, waste metal, waste iron, &c., Briqueting fires of..2 pats.. M. Glass
Ornamental articles, Producing..... ..... W. E. Heeren
Outsole-marker..... W. C. Stewart
Packing for annealing and other like apparatus, Fusible..... W. R. Kinnear
Packing for cylinder-molds..... H. Parker
Paper and grooving same..... ..... W. E. Ramage and H. D. Shaw
Paper-entting machines, Cutting-stick for.. ..... B. M. Helm
Paper-entting shears..... A. Worcester
Paper-making machine..... F. N. Hamlin
Paper-pulp engines, Roller-bar for..... ..... C. I. Ware
Paste-applying apparatus for can ends.... ..... A. Johnson
Paste-box..... O. Dreher
Pavements, Making..... J. Y. McClintock
Penholder, Fountain..... H. S. Brewington
Perambulator, Convertible..... J. Ford
Perambulator, Folding..... F. A. Nauts
Pianos, Coin-controlled aetuating meehanism for autopneumatic..... A. J. Hobart
Picture film, Motion..... A. L. Clawson
Piece goods, Apparatus for piling..... ..... J. W. Banks
Pillow..... J. L. Kennedy
Pin..... J. H. Reed
Pin safety-catch..... S. J. McMillen
Pipe..... C. A. Lord
Pipe support and clamp..... D. Williams
Piston..... A. L. Mowry
Planetarinm..... A. Laing
Planter, Corn or cotton..... C. Wilks
Plow, Motor..... J. J. Middlebrook
Plow, Sulky..... H. P. Cnrtright
Plows, Adjustable beam and frame for sulky and gang..... H. S. Busby
Plows, Potato-digging attachment for..... ..... F. Day
Pneumatic-dispateh-tube apparatus, Carrier for..... M. L. Emerson
Pole-anchor..... K. T. Hovrud
Post-binder..... R. E. Murphy
Posts, Construetion of..... R. C. Stewart
Potato-digger..... J. S. Hogeland
Power-plant, Hydro-eleetric... F. W. Ballard
Press ..... J. Thomson
Printing-machine, Rotary ....A. B. Evans and G. C. H. Wichmann
Printing-press..... J. Thomson
Printing-press...2 pats..... F. Meisel
Projection apparatus..... W. L. Patterson
Propeller..... G. Gays
Propeller..... M. Cooksey
Propelling means for vessels..... J. Sincic
Protective devicc..... R. H. Manson
Pnll-socket..... F. W. Slady
Pnlley, Power-transmitting.... W. A. Owen
Pulley, Safety..... P. J. A. Schnoor
Pnllcys, Crane for clothes-line.. L. F. Beeker
Pulp and analogous materials, Machine for forming articles from..... A. Shackleton
Pump, Rotary..... J. R. Kinney
Pump, Vacuum..... J. T. Wilkin
Pumping systems, Regulator for gas..... ..... E. Schulte

Punching-machine.....J. H. Thompson
Quick-acting wrench.....W. R. Bresee
Radiators, Vent attachment for.....W. L. Walter
Rail.....J. C. Getty
Rail-bond.....C. R. Sturdevant
Rail chair and coupling.....J. C. Evans and P. G. Hill
Rail-jack.....G. K. Reiley
Rail-joint.....C. J. Mills
Rail-joint.....W. P. Davis
Rail-retainer.....T. J. Donovan
Railway-gate.....J. T. Corrigan
Railway-lantern.....G. H. Rolfes
Railway-spike.....R. A. Rossmeisl
Railway-switch, Automatic.....A. L. Pipes
Railway-tie.....J. M. Cleary
Railway-tie.....J. A. Byers
Railway-tie and fastening.....W. E. Clark
Railway-tie and rail-fastener.....H. M. Gaul, Jr.
Railway water-supply, Stand-pipe for.....P. H. Knight
Rake.....P. Gladhack
Range attachment, Gas....M. F. O'Donohoe
Razor, Safety.....A. F. Durand
Receptacle, Metallic.....J. H. Stiggleman
Regenerative control system.....W. Cooper
Regenerative furnace.....F. Meyer
Relay.....A. S. Cubitt
Resilient wheel for road-vehicles.....T. Oldfield and J. A. Schofield
Respirator and inhaler.....R. Venner
Respirator (smoke-protector)....M. Panian
Rheostat.....W. C. Yates
Rings, Holder for rotary.....B. Hall
Road construction.....J. H. Amies
Road-roller.....F. F. Williamson and D. Brennan, Jr.
Rod-supporting device.....C. C. Blake
Rodent-trap.....J. R. Scott
Rolling mechanism.....F. H. Richards
Roof-joint.....H. B. Mikesell
Roof-shoe.....C. W. Phinny
Roofing.....F. D. Cook
Rotary engine.....G. W. Bartlett
Rotary engine.....B. F. Wickersham
Rotary jack.....W. C. Stewart
Rotary steam-engine.....G. A. Metcalf, W. C. and L. T. Rocheleau
Sad-iron.....J. M. Harper
Sad-iron holder.....F. E. Griffeth
Saddle, Harness.....A. Homann
Safe door, Burglar-proof.....L. G. Glazier
Sash-cord guide.....F. C. W. Kuehn
Sawmill-carriage.....G. E. Campbell
Sawmill-carriages, Wheel-guard and track-cleaner for.....G. O. Beasley
Scale.....H. B. Sherwood
Scale dial, Computing.....J. E. Cochran
Sealer, Fruit-jar.....W. G. Hall
Sealing device for electric meters.....W. N. Alexander
Seed-delinting machine, Cotton.....W. E. Worth
Self-waiting table.....K. J. Olson
Sewing-machine.....F. La Chapelle
Sewing-machine...2 pats.....T. G. Plant
Sewing-machine, Shoe.....J. J. Heys
Sewing-machine, Shoe..2 pats..T. G. Plant
Sewing-machine, welt-holder....T. G. Plant
Sewing-machines, Tabi-fastener attachment for.....C. M. Horton
Shade and curtain bracket.....M. Bassett
Shaft controlling means, Driving.....T. G. Plant
Shaft-coupling.....B. P. and F. I. Remy
Shaft, Leather-skiving-machine.....L. Muther et al
Sharpening apparatus, Disk-harrow.....P. Bender
Sheep-shears.....E. Ascue
Sheet-metal cutting or trimming machine..F. R. Eden
Sheet-metal vessel.....W. J. Reuter
Ships, Means for unloading...M. J. Furlong
Shock-loader.....F. Burk
Shoe, Collapsible.....E. Probst
Shoe-jack...2 pats.....T. G. Plant
Shoe-jack, Automatic rotary....P. R. Glass
Shoe-polishing machine.....D. L. Hudson
Shoe-supporting rack.....G. T. McLeod
Sign-board, Changeable.....H. Willson
Signaling apparatus, Electric..L. W. Carroll
Signaling system.....O. T. Lademan
Signaling system and apparatus therefor, Call-box.....C. C. Johnson
Silica bricks, ganister, and other refractory materials, Manufacture of.....H. Bearley and F. C. Noorwood
Silo.....J. T. Ridgway
Siphon.....C. F. Meade
Skate, Detachable wagon.....M. Aubertel
Skirt-marker.....E. David
Slate-picker.....H. A. Whitman
Sleigh-knee.....F. Shillin
Smoothing and polishing articles and parts, Compound for.....W. R. Parsons
Socket, Extension.....R. B. Benjamin
Sole-beveling machine, Shoe...W. Dennison
Sole edge setter, Shoe.....G. F. Stewart
Sole flexer, Shoe.....T. G. Plant
Sole laying and leveling machine.....E. Wodward
Sole-marking machine.....W. C. Stewart
Sole-rounding machine.....C. P. Stanborn
Soles of boots and shoes, Machine for slashing.....W. C. Stewart
Soles to hoots and shoes by screws, Machine for attaching.....M. T. Denne
Sorting-table.....J. T. Cowley and E. G. Thomas
Sound-record, Duplicate...J. W. Aylsworth
Sound-reproducing machines, Stylus for....S. Levin
Spades, Sod-cutting attachment for.....A. N. Severson
Spark-arrester.....F. A. Just
Spark-plug.....F. J. Heasel
Speed and time indicator, Combined.....T. Bauerle
Spraying attachment.....C. H. Rath
Sprinkler.....C. C. Corlew
Square, Try.....C. G. Larson
Stacker and elevator, Straw...A. Rosenthal
Stacker, Pneumatic straw.....P. T. Kirkpatrick
Stamp, Hand.....M. C. Price
Stand-boiler.....W. Sherwood
Stapling-machines, Wire-feeding mechanism for.....H. Weber
Starting and stopping mechanism.....M. D. Phelan
Starting and stopping mechanism.....T. G. Plant
Steam and water heater combined, Exhaust-regenerating.....S. H. Hale
Steam-generator.....J. Buckley
Steam-generator.....R. Dunkel
Steam-superheating apparatus.....H. Cruse
Sterilizer and drier.....A. Jensen
Stopping mechanism.....T. G. Plant
Store-front and show-case construction.....H. S. Conrow
Stove, Electric cook.....F. H. Zeigin
Street and road construction...J. H. Amies
Suction-slice.....W. H. Millspaugh
Surgical instrument.....J. S. Rydell
Sweep-rake.....C. Pearson
Sweeping compound and making same.....J. P. Porteus
Switching-key.....L. A. Williams
Tablet, Writing.....R. C. Kuhn
Tack-pounder.....W. C. Stewart
Tacker, Automatic hand....J. Gelzenlichter
Tacker, Portable power.....M. D. Phelan
Tackers, Loading mechanism for hand.....P. R. Glass
Tag.....B. F. Gardner
Talking-machines, Supporting device for sound-box arms and horns of.....R. L. Gibson
Tanks, Manufacture of wall....R. E. Crane
Tanning machine, Automatic...C. J. Glasel
Tantalum, Producing.....J. Schilling
Telegraphy, Portable station for wireless..G. von Arco
Telegraphy, Receiver for wireless.....W. Schloemilch
Telephone-meter system and apparatus.....R. H. Manson
Telephone-repeater.....P. Stragiotti
Telephone system.....L. E. Hicks
Telephone system.....E. C. Rodman
Telephone system.....C. L. Goodrum
Telephone system and apparatus.....A. K. Andriano
Telephone system, Intercommunicating.....E. R. Corwin
Telephonic transmitter.....P. Stragiotti
Temperature-regulator, Thermostatic.....D. O. Nation
Tent, Shelter.....N. D. Anderson
Threshing-machine, frame.....J. B. Bartholomew
Threshold, Illuminated.....C. B. Ricketts
Ticket-holder, Car.....J. H. Baker et al
Tie-plate.....W. McKee
Tile-mold.....F. Gorman
Time-computer, Automatic...R. H. Bouslog
Tipping furnace, mixer, &c.....J. L. Klindworth
Tire-protector.....J. Wilmes
Tire wrapping and unwrapping machine..N. E. Raber
Tobacco-pipe.....H. Willis
Tobacco-shield.....J. H. Scott
Tobacco-smoking pipe.....W. E. Hooker
Toilet article.....P. H. Watson
Tongs.....V. D. Carroll
Tool-bag.....T. J. Younglove
Tool-frame.....A. Neubert
Toothpick.....J. G. Strock
Torpedo-tube attachment.....J. Kimbrell
Tracker-bar.....G. P. Brand
Traction-engine.....G. L. Hinshaw and H. A. Wade
Train-stopping mechanism...J. F. Webb, Jr.
Transmission apparatus.....J. A. Baab
Transmitter-mounting.....N Pedersen
Tread-plug, Non-slipping.....J. L. Campbell
Treadle, Foot.....E. Bourquin
Treeing-machine...2 pats....W. H. Hooper
Treeing-machine, Boot.....W. H. Hooper
Trees, Reinforcing...3 pats....W E. Davey
Trombone, Slide.....H. N. White
Trousers-stretcher.....R. P. Baird
Truck construction for cars.....S. P. Bush
Truck side frame.....A. O. Buckius, Jr.
Truck side frame.....E. M. Richardson
Truck side frame, Car.....J. H. Baker
Truss.....T. E. Martin
Tube-cleaner.....E. E. Hauer
Tube forming and cutting-off machine....C. F. Jenkins
Tuunel.....W. Butler
Turbine.....R. C. Frohlich
Turbine.....C. A. Parsons
Turbine-blades, Means for securing.....P. Emden et al
Turbine, Elastic-fluid.....E. Thomson
Turbine governing mechanism..R. H. Rice
Turbine governing mechanism, Elastic-fluid.....W. Kieser
Turbine governing mechanism, Elastic-fluid.....P. Olivier
Turbine shafts, Packing for elastic-fluid...O. Junggren
Turbine, Water.....E. A. Nilsen
Turbines and pumps, Means for balancing..W. H. Eyermann
Turbo-unipolar generator.....O. Schulz
Type and type-bars, Making.....F. H. Richards
Type-bar.....F. H. Richards
Type-distributing apparatus....R. Dacheux
Type-writer-ribbon box.....G. M. Crider
Type-writing machine.....S. Nielsen
Type-writing machine.....C. B. Yaw
Type-writing machine.....E. B. Hess
Type-writing-machine carriages, Ball-bearing for.....E. B. Hess
Type-writing-machine-ribbon mechanism...C. Gabrielson
Types and type-bars, Machine for making.....F. H. Richards
Umbrella-receptacle for cars....M. Colonna
Umbrella top-notcher.....F. Wetteroth
Undergarment.....G. S. Marville
Universal joint, Incased.....C. W. Spicer
Upholstered chair.....P. G. A. Bode
Urea of the anthraquinone series and making same.....A. Schmidt et al
Valve.....F. Snow
Valve.....D. E. Washingtou
Valve.....J. W. McCown
Valve and meter, Combination..E. J. Moore
Valve, Automatic gas.....J. Hrivnak et al
Valve, Brake.....W. K. Rankin
Valve for pneumatic sanders, Engineer's..J. H. Hanlon
Valve mechanism for water-columns.....F. C. Anderson
Valve, Regulating.....A. M. Allen
Valve, Rotary.....R. W. Riordan
Valve, Siphon.....L. T. Burns
Vapor-apparatus controlling device.....P. H. Thomas
Vapor-apparatus starting device.....P. H. Thomas
Vapor-rectifier system.....C. M. Green
Vehicle, Motor.....F. H. Johnson
Vehicle, Motor.....J. J. Middlehrook
Vehicle-seat, Adjustable.....R. G. Ledig
Vehicle shock-absorber.....T. Lea
Vehicle-spring arrangement...J. Rosemeyer
Vehicle-wheel.....C. D. Anderson
Vehicle-wheel.....M. W. Rosenshine
Veil, Automobile.....J. V. Siegel
Vending-machine.....J. F. Krcma
Vending-machine.....R. F. Downey
Vending-machine, Centering mechanism for rotary.....E. S. Hagen
Vending-machine, Cigar.....H. R. Stouder
Vessels, Device for determining the metacentric height of.....E. Tate et al
Vest-corner stiffner.....C. D. Clements
Vibrator, Electric.....S. W. Moon
Vibrator for induction-coils..B. L. Lawton
Violin.....J. A. Martin
Vise, Bench...2 pats.....J. R. Long
Wall, Heating-insulating.....C. J. Coleman
Washbench.....J. I. Harrington
Washing-machine gearing.....H. L. Staley
Washing-machine gearing...O. H. Watkins
Water-gage.....F. Baker
Water-heater.....W. T. Hicks
Water-heater, Instantaneous.....S. Tache
Water-meter.....O. F. Kadow
Water-motor.....J. N. Hardy
Watering-trough.....T. C. Pereboom
Wave or current motor.....J. E. Bennett
Weed-hook, Sectional.....H. E. Woodin
Weighing device, Spring-scale.....H. B. Puffenberger
Well-casing-repairing tool....J. C. Mettler
Well mechanism.....M. E. Layne
Well strainer, Oil and water..H. R. Decker
Welt laying and attaching machine.....G. T. McLeod
Wheels in divided metallic molds, Apparatus for producing.....C. Grunwald
Whiffletree.....J. J. Bunting
Window.....A. F. Cizek
Window-frame.....W. B. Harris
Window-screen.....P. Ried
Writing-machine.....E. B. Hess
X-ray tube.....H. Green
Yoke center, Neck.....G. A. Lambert

DESIGNS.

Buckle.....J. R. Smith
Horn.....V. Pasucci
Prescription-case.....C. F. Kurz
Range, Gas.....G. M. Koke
Spoon, Olive.....M. Burgunder
Stone, Cut.....E. G. H. Schenck
Talking-machine cabinet.....M. Keen
Watch-charm.....R. A. Pohlmann
Watch-case.....A. M. Bissig

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Acetylene-machines, Pipe-frame for.....L. B. Lake
Adding and subtracting machine.....C. F. Kettering
Adhesive compound or sizing..M. R. Isaacs
Advertising-chair.....A. Biehl
Aerial ship.....F. W. Schroeder
Air-brake.....T. J. Henretta
Air-brake signaling device..F. H. Dukesmith
Air-brake-testing apparatus...2 pats.....F. H. Dukesmith
Air-brake-testing system...F. H. Dukesmith
Air-heater.....W. N. Le Page
Airships, Device for feeding balloonets on..M. Kapferer
Alloys, Making copper.....G. Boericke
Annunciator-drop...2 pats.....C. Auth
Asparagus and kindred plants, Treating.....E. C. Kline
Automatic lubricator.....J. W. Shafer
Automobile-engine starting device.....A. M. Walstrom
Automobile steering-wheel....R. E. Bowers
Automobile wind-shield, Sectional.....A. L. Woodward
Axle-box dust-guard, Car.....W. A. Briggs et al
Axles, stay and other bolts, &c., Rod for..F. M. Patterson
Baling-press.....F. W. Williams
Baling-press feeding device...C. J. Johnson
Ball-joint, Flexible.....C. O'Neill et al
Bank-note cutter.....H. E. Hoke
Barrel-carrying device.....S. C. Jensen
Barrow, Dumping.....L. M. Schoonmaker
Bearing, Combination roller.....C. S. Lockwood
Bearing, Roller.....W. W. Dennis
Beater and mixer.....W. H. Ashby
Bed, Frameless spring.....T. A. B. Putnam
Bed-pan, Elastic.....F. M. Otis
Bed, Screen.....O. O. Richardson
Bedclothing-rest.....M. E. L. Bergen
Bedstead-spindles, Means for securing.....J. C. Wilson
Belt pin or buckle.....L. Hauser
Binder, Temporary.....C. D. Trussell
Binder, Temporary.....C. D. and A. E. Trussell
Blind holder, Window.....O. Thomasen
Block-molding machine.....J. W. Bragstad
Blower, Positive-pressure.....F. P. Bolaud
Boat fender-brake.....J. Boydell
Boiler attachment, Locomotive or other.....C. F. Harris
Boiler-cleaning attachment, Water-tube.....E. Stephenson
Boiler-flue, Detachable.....J. F. Drake
Boilers, Automatic jack for engine..C. Kent
Book-cover, Metallic....S. S. Andrews et al
Book-holder.....W. C. Traher
Book-holder, Sales.....N. F. Garbo
Book-smashing machine.....S. K. White
Boot or shoe attachment.....C. Waldstein
Boring-machine.....G. H. Smith
Bottle-capping machine, Milk...D. S. Yard
Bottle-cap remover and stopper, Combined..A. R. Hoeft
Bottle, Non-refillable.....W. C. Wilson
Bottle, Non-refillable.....C. Councell
Box-blank and using the same..J. F. Adams
Box-fastener.....J. P. Fritz
Box-making machine.....G. D. Parker
Brace-clamp.....J. D. Maddox
Bread-mixer.....W. A. Babbitt
Breakers, spreaders, &c., Automatic regulating device for.....W. H. L. Mellis
Brick-making apparatus.....W. Hanley
Brick-molding machine.....T. Young
Brick-setting frame.....R. C. Penfield
Briquet-machines, Mixing apparatus for....G. Komarek
Briquets, Manufacturing...T. G. A. Wilson
Brooder.....C. E. Adair
Broom-corn and the like, Machine for bundling or compressing.....J. F. Foley
Broom-holder.....J. T. Holte
Brush, Dental...2 pats.....J. H. Abbott
Brush-holder.....P. T. Flach
Buckle.....W. A. Holden
Bundle or package tie.....F. S. Chappell
Brush-puller.....J. G. O'Donnell
Butter or cheese receptacle...E. D. Burton
Button cutting and drilling machine.....R. McCoy
Cable-hanger.....F. D. Ogden
Cable-splicer.....J. Urbanz
Can-caps, Means for applying solder rings to.....W. J. Phelps
Can-forming apparatus.....C. W. Graham
Cans or the like, Closing device for.....H. Hintermann
Candy-cutting machine.....J. H. Bennett
Cane, Apparatus for treating sugar.....A. and S. Wynberg
Car buffer, Mine.....V. E. Lane
Car-coupling.....D. S. Montgomery
Car-door.....F. Horn
Car-fender.....A. H. Carter
Car-lines, Apparatus for tabulating the passenger traffic on.....J. T. Crabbs
Car, Mining.....J. Blair
Car-roof.....J. Marold
Car-wheel.....E. A. Johnson
Car-wheel press.....G. T. Reiss
Carbureter.....J. W. Snedeker
Carbureter.....W. Ottaway
Carbureting apparatus.....G. Johnson
Cards, Device for reflecting the concealed side of.....W. T. Peckham
Cards, Head for punching five and six frame brussels.....W. K. Caldwell
Carpet-fastener.....H. Weinstock
Caster.....G. W. Bent
Cautery, Electric.....W. Meyer
Centering apparatus.....J. T. Rice
Centrifugal separators, Hollow shaft for...C. H. Shaw
Chain and wheel therefor, Drive.....W. J. Belcher
Chain, Drive.....W. J. Belcher
Chair fan attachment, Rocking..P. Pezzene
Chicken-hovel.....J. S. Pieronnet
Chimney-top.....A. Zwingli
Chlorid solutions, Regenerating stannic.....J. Weber
Chuck.....G. J. Thomas
Churn.....A. Massie
Cigar-band.....G. Labarre
Cigar carrying and displaying receptacle..A. G. Kaufman
Cigar-clipper attachment for pencils.....J. C. Thorne
Cigar-maker's box aud rolling-board.....J. Kletti
Circuit-closer.....H. C. Thomson
Clevis.....R. H. Hammock
Clock, Alarm.....G. Keru
Closing-disk.....W. L. Wright
Clothes-line support.....W. L. Anderson
Coal and rock drilling machine...C. Seals
Coal, Coking.....S. B. Sheldon
Coaster-brake.....T. Falkos
Coat.....P. Shotland
Cock, Basin.....J. F. Kelly
Cock, Safety gas.....E. Van Wickle
Coiling mechanism.....F. H. Richards
Coke-ovens, Folding coke and coal handling machine for.....J. E. A. Moore
Color-stamping, Composition of matter adapted for use in art of...S. Weinberg
Colors and making same, Nitro-ortho-oxy-azo.....K. Elhel
Combination-lock.....O. M. Larkin
Compositiou of matter and making same...W. A. Phillips
Concrete pile, Metal-reinforced...E. Mohuu
Concrete, Support for.....J. P. Hallahan
Concrete wall construction.....L. Lapersonnerie
Controller.....F. D. Hallock
Controlling mechanism, Fluid-operated.....J. W. Anderson
Cooler.....O. A. Kersey
Copying device, Press.....H. A. Benner
Corer.....J. E. Wyant
Cork-tapering machiue.....I. T. McCready
Corn cleaner and separator, Shelled.....D. B. Raworth
Cot-holder.....M. R. Rodrigues
Cotton-chopper.....R. T. Simmons
Crate, Collapsible.....L. M. Lcihowitz
Crating apparatus, Chicken....J. De Young
Cross-arm brace.....J. D. Love
Cross-roll trough.....H. D. Peunington
Crushiug or pulverizing machine.....J. L. Hiller

Culiuary implement.....T. J. Fisher
Currents. Method and apparatus for producing high-frequency oscillating.....J. H. Rogers
Cuspidor.....F. J. Cross
Cut-off and filter, Automatic...F. J. Crane
Cutlery-cleaning machine, Table.....A. Uhlyarik
Dental engines, Hydraulic motor for.....O. L. Kellett
Dental forceps.....E. C. Lombard
Developing-tank.....L. N Chapin
Digester and the like.....C. H. Craigue
Dish-drainer.....M. A. Dennis
Dish-washer.....A. Walther
Dish-washing machine.....J. C. Knapp
Disiufecting device.....A. B. Buckland
Distillery-slop, Desiccating.....E. H. Brinkman et al
Distributing-board and cross-connecting rack, Fused.....R. G. Hardgrave
Door.....A. Ritter
Door catch or check.....G. W. Mallory
Door check and buffer, Combined.....L. L. Hamilton
Door-closer.....M. K. Snyder
Door, Collapsible.....H. Hedwall
Door-frame.....E. A. Ekedahl
Door-operating device, Jail.....C. M. Fineh et al
Doubling and twisting machines, Stop-motion for.....R. S. Rheinhardt
Draft-equalizing device.....A. Hines
Drainage connection.....A. I. Jones
Dredging apparatus.....W. R. Comfort
Drill.....A. Godlewski
Drilling-machine.....N. D. Levin
Drilliug-machine.....H. J. Harvey
Dye.....Runkel et al
Dye and making, Black mono-azo..F. Scholl
Dye and making, Orange disazo.....M. Boniger
Filter for cyanid plauts, Centrifugal.....C. Shapley
Dye, Orange azo.....K. Schnitzspahn
Dye, Wool.....We. Berchelmann
Educational appliance.....J. Spencer
Electric-circuit breaker.....W. H. Scott
Electric furnace.....H. A. Danne
Electric heater.....G. E. Stevens
Electric switch.....J. F. McElroy
Electric switches, Pull-socket for..F. Barr
Electrical-conductor hanger....W. Schaake
Electrical energy, Transmission of.....W. F. Gradolph et al
Electrical energy, Transmitting.....W. F. Gradolph et al
Electrically-actuated switch...F. G. Proutt
Electrode, Arc-lamp.....J. H. Hallberg
Elevator.....B. Epstein
Elevator safety device.....J. A. Sissom
Energy storing and using system.....G. W. Bulley
Engine-cylinder.....G. J. Bryen
Engine starting device, Internal-combustion.....J. B. Dickey
Engine-starting mechanism....F. D. James
Engine-starting mechanism, Explosive.....C. E. Reddig
Envelop.....L. C. Van Riper
Envelop.....O. J. Olm.
Envelop.....J. W. Tyiska
Expansion-bolt.....C. C. Tomlinson
Extensible connectiou.....M. E. Wells
Eyeglasses.....R. H. Simonds
Fabrics ornaments interwoven with a brass wire, Machine for applying to..H. Martin
Fan or propellor, Rotary....H. Rnthenberg
Fasteners, Machine for settiug and forming metallic.....R. B. Lewis
Fastening members, Attaching means for..F. S. Carr
Faucet.....A. R. Pritchard
Faucet, Locking.....J. S. Ericson
Feed-cutters, Knife-adjusting means for....J. J. Gromme
Feed-water regulator.....L. B. Fulton
Fence-post and anchorage-base..P. T. Bailey
Fifth-wheel for dump wagons.....L. H. Young
File and holder, Document.....J. Wilson
File,Emery-cloth.....E. Ganz
File, Emery-cloth.....E. Ganz
Filter-producing apparatus.....C. H. Loew
Fire-alarm systems, Signal-box for.....F. S. Bronson
Fire-check.....A. A. Steward
Fire-escape.....J. W. Thompson
Fire-hydrant coupling.....E. W. Purves
Firearm.....T. C. Johnson
Firearm.....H. M. Kolb
Firearm, Automatic.....R. Frommer
Firearm, Silent...2 pats....H. P. Maxim
Firearms, Offset-adapter for teleseopes for.....W. Bennett
Fishing-rod line-guide..W. Shakespeare, Jr.
Flanges on demountable rims, Means for locking.....A. Dow
Flies and other insects, Device for catching.....J. Nault
Floor-dressing machine....G. J. Kepplinger
Floor-surfacing device.....C. W. Wiley
Fluid-controlling device.....A. C. Nelson
Fluid-pressure brake.....J. W. Cloud
Fluid-pressure brake....F. B. Farmer et al
Flushing device.....H. M. Smith et al
Flushing device, Closet.....C. H. Duncan
Fly-wheel for wrapping and balling machines.....A. E. Rhoades
Flying-machine.....J. Koskine
Flying-machine.....J. Buchauan
Folding box.....J. G. Reber
Folding device.....W. F. Klinck
Force-feed lubricator.....H. L. Davis
Forcing frame or inclosure for horticultural or other purposes.....W. Cutler
Forging press and hammer....E. H. Wray
Front-end arrangement.....J. F. and H. M. Brown
Fruit-gatherer.....R. Fountain
Fuel.....A. B. Hill
Fuel, Production of.....T. Parker
Furnace.....W. H. Perkins
Furnace.....J. M. Brooks
Furnace.....H. J. Hough et al
Furnace.....J. A. Penny
Furnace grate, Forced-draft..W. H. Palmer
Fuse-plug.....W. H. Duckwitz
Gambrel.....H. Barrows
Game apparatus.....E. P. Chambers
Game apparatus.....W. A. Sullivan
Garment-hanger, Comination.....W. C. Thatcher
Garment-supporter.....C. J. White
Gas-burner.....B. E. Meacham
Gas-burner or heater.....C. F. Holtzann
Gas-controlling device.....W. C. Simmons
Gas-engine.....R. J. Leach
Gas-engine.....J. V. Rice, Jr.
Gas-engine, Reciprocating...W. M. Leedom
Gas generator and burner, Oil.....G. Drummond
Gas-making apparatus.....P. A. Emanuel
Gas-plants, Pressure-regulator for.....F. L. Cross
Gearing, Differential.....H. A. H. Salomo
Gearing, Two-speed.....F. P. Fentress
Glass articles, Manufacture of.....H. G. Slingluff
Glass cutter, Circular.....W. Chase, Jr.
Glass-heating apparatus.....A. Hauson
Glass-making apparatus, Wire.....W. S. Temple
Glass, Method of and machine for making wire.....A. J. Baldwin
Glass tiles and similar articles, Manufacture of.....G. W. Blair
Glucosid and making same, New.....S. Posternak
Golf-club.....A. C. Fowler
Grab-hook, Trip.....M. V. Spencer
Grader and scraper, Road.....F. L. Reising
Grappling-hook, Hopper-closet..E. C. Fraw
Grass, straw and the like, Apparatus for separating aud combiug.....G. A. Lowry
Grease-cup.....J. G. Matheny
Grinding and polishing disk.....C. Glover
Gun-muller.....J. H. Stinson
Gun-sight.....C. F. Wollenberg
Gun-stock, Adjustable.....S. Powers
Gun-support.....L. V. Benet et al
Handle.....G. Lemieux
Harness back-pad and collar-pad.....L. P. Overshiner
Harrow.....W. D. Walton
Hay-rack.....J. Voll et al
Hay-rack rake.....I. R. Reeves
Heating device, Electric.....R. L. Hailey
Hide-unhairing machines, Roller for.....H. B. Reeves
Hinge.....C. Glover
Hinge.....J. Tritsch
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Hoist.....R. Miller
Hoisting and dumping mechanism.....J. P. Zoller
Horse controlling or hitching device.....A. L. Harvey
Horse-detacher.....S. Molnar
Horse-power loader...J. P. and J. A. Lucas
Hose-coupling.....W. W. Keys
Hose-coupling, Automatic train.....J. F. McElroy
Hose-pipes, End connection for metallic....E. Witzenmann
Hub, Wheel.....C. L. Johnson
Hydrant attachmeut.....W. H. Wileman
Hydrated sodium carbouate and sodium tannate, Composition of.....W. E. Ridenour
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Ignition systems, Wire bar for..C. Schmidt
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Insect-trap.....J. F. Watts
Iusulator and conductor for electric currents.....A. Champion
Insulator, Battery-plate.....C. J. Bristol
Iuternal-eombustion engine.....O. A. Stranahan
Ironing-machine.....C. B. Gartrell
Irrigation apparatus.....E. Olsson
Jack.....J. Dixon
Joint or miter planer tool...C. R. Ladeveze
Journal-box.....W. Neuhs
Keyhole-guard.....J. W. Beuedict
Kilns, Fuel-feeding means for cemeut.....A. Neu
Kitchen utensil.....J. P. Ibsou
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Ladder.....J. J. Dennis
Lamp.....O. J. Holt
Lamp, Arc.....L. W. Pullen
Lamp, Electric-arc.....L. W. Pulleu
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Lamp for vaporized-liquid combustibles, Incandescent.....H. Wiktorin
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Lanteru and lunch-receptacle.....E. Cunningham
Latch.....A. Bock
Lawu-sprinkler.....J. B. Steele
Lens-mount...2 pats.....H. E. Richmond
Level, Spirit.....C. Bodmer
Lifting-jack.....A. Neal
Lifting-jack.....C. H. Noyes
Lightning-arrester.....W. W. Deau
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Liquid-concentrating apparatus..P. Kestnes
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Liquid-dispensing apparatus.....W. Helmer
Load-binder, wire-tightener, and lifting-jack.....J. L. Shipman
Lock.....A. Lawson
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Lock-nut mechanism.....J. Perrie
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Locomotive, Compressed-air..C. G. Herman
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Locomotives, Device for controlling cylinder-cocks of.....J. H. De Salis
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Loom, Weft-replenishing..A. A. Gordon, Jr.
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Loop-setting machine.....W. A. McAllister
Magneto-electric generator.....B. P. and F. I. Remy
Magnetic switch.....J. J. Wood
Magneto, High-frequency.....T. M. Mueller
Malting apparatus..5 pats....W. H. Prinz
Marble-shooter.....M. E. Reilly
Massage apparatus.....G. R. Pyper
Match-box, Single delivery.....M. Myerson
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Measuring instrument, Electrical.....J. L. Zander
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Melting and refining furnace, Electric.....H. Nathusins
Metal, Composition.....J. Naulty et al
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Metals, Apparatus for removing tarnish from.....M. H. Keyt
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Milking-machine.....J. J. Bukolt
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Mold.....W. A. Riddell
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Plow, Hand.....A. R. Corrington
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Printing or embossing cylinders, Machiue for grinding.....C. H. Hope
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Resilient wheel.....G. A. Spaeth
Revolving cutter.....J. H. Barker
Rheostat.....F. D. Hallock
Rheostat for electric motors, Regulating...F. D. Hallock
Rheostat, Regulating.....F. D. Hallock
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Ribbon-clip.....A. L. Kahn
Rivet.....E. B. Stimpson
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Rotary engine.....L. L. A. Seguin
Rubber-extractiug apparatus....L. Guiguet
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Scaffolding.....W. Wells
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Sealing and stamping machine, Envelop....E. J. Abbott
Sectional mold.....B. M. Bangs
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Sewing machine, Broom.....L. P. Rapp
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Shoe parts, Machine for recessing.....A. H. Prenzel
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Shoe-trimming machine.....W. B. Keighley
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Sink-frame.....B. Martin
Siphon-filler.....P. Vock
Skylight.....W. K. H. Langer
Skylight-lift.....W. C. Habicht
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Snap-hook, Spring-tongue.....J. C. Covert
Soldering and surplus-solder-removing machine, Can.....M. Leitch
Soldering-iron.....W. R. Lanum
Soldering machine, Can....D. P. Robinson
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Sole patch, Shoe.....J. W. Britton
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Spectacles and the like, Straight-side.....E. Barnes
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Spinning and twisting machine...R. Dawes
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Stacker, Hay.....J. Durkee
Staging-bracket.....O. L. Johnson
Staple.....H. F. Merrill
Starch into derivatives, dextrin, dextrose, &c., Converting.....S. M. Lillie
Starting device.....W. McKissick
Station-indicator.....C. Messing
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Stenciling-machine.....J. Sokolov
Stereoscope.....A. E. Foote
Stereotype-block.....A. O. Taylor
Stitch machine, Imitation...L. W. G. Flynt
Stool.....S. Ryave
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Store-service wireway.....C. E. Thompson
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Stovepipe-snip.....H. G. Millington
Street-sweeper.....J. Otis
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Surgical appliance.....T. E. Rodgers
Surveying instrument.....M. J. Dikeman
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Switch.....F. Homan
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Telegraphy, Aerial conductor arrangement for wireless.....G. von Arco
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Telephone switch-hook.....B. W. Sweet
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Tire.....A. Kessler, Jr.
Tire-case.....C. A. Russell
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Tongs, Clothes.....W. J. aud A. Ott
Tongue-hounds, Adjustable pattern for....N. J. Smith
Tool.....N. M. Hansen
Tool-holder.....J. J. McIntyre
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Tool-holder, Ratchet.....J. Volbert
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Torpedo.....E. Bourdelles
Toy.....W. S. Hendron
Toy base-ball game apparatus.....J. A. Ekelund
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Trolley-poles and other articles, Clamp for mending broken.....R. W. Lovett
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Type casting and setting machine, Individual.....J. C. Fowler
Type-machines, Mold and operating mechanism for.....E. S. Dunavant
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Valve for heat-engines, Puppet.....L. G. Nilson
Valve mechanism for engines.....J. W. Guthrie
Valve, Relay air.....H. J. Richardson
Valve, Steam, air, and water trap.....J. E. Boegen
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Vapor-burner.....A. H. Waite
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Welding-machine, Electric.....A. E. Buchenberg
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Wire-fabric-making machine..W. N. Parrish
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Button.....A. S. Rollings
Jewel-setting for finger-rings or similar articles.....M. C. Meyer
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Buckle, Trace.....E. C. Kimball
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Building-block.....W. R. Dodds
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Cabinet, Sanitary cold-air food.....C. A. Buel, Jr.
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Cables, Branch-block for suspended.....J. S. Stewart
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Calendar, Perpetual.....E. W. Doolittle
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Calipers, Micrometer.....Z. R. Tucker
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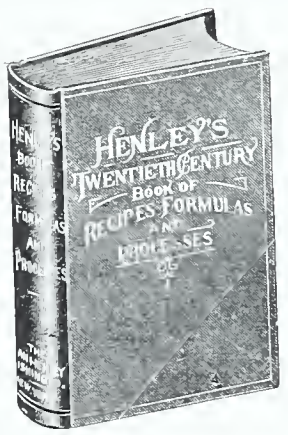

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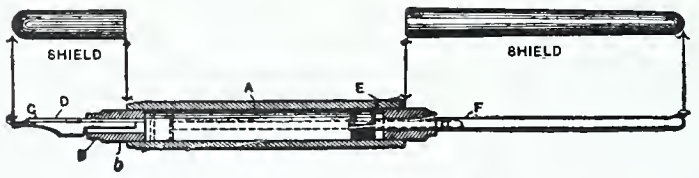

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GASOLINE MOTOR TRACTOR.

By FRANK C. PERKINS.

THE illustration below shows the construction of a unique gasoline tractor which is utilized to advantage on the farm for plowing and other service, and has a pull of 3½ tons. This tractor which is constructed at Waynesboro, Pa., measures about 9 feet in width and height, and 14 feet in length. The engine, when working at full load, has a fuel consumption of one gallon per horsepower per ten hours, and the fuel tank provided has a capacity of 90 gallons.

The throttle system of governing is employed, the normal speed of the engine being 600 revolutions per minute, and a driving pulley operating at this speed and having a diameter of 28 inches is provided.

A motor of the four-cycle four-cylinder type is used on this engine, with a bore of 7 inches and a stroke of 7 inches. The cylinders and valves are water jacketed. It has a crank 2⅝ inches in diameter, steam forged from one piece without welds, with five bearings provided to support the crank. The lubrication of the center bearings is by the splash system, and of the end bearings, by force feed from a mechanical oiler.

A mechanical force feed oiler is used for lubricating the cylinders, the connecting rods dipping in a bath of oil on each revolution of the crank. The crank base is so arranged that the oil for each cylinder is in a pocket which prevents it from running to one end of the base when the engine is standing out of plumb. The ignition is by jump spark and the magneto is of the ball bearing type, while batteries are utilized also as a reserve and for starting. The power is transmitted from the engine by steel gears through a friction clutch, and the gears in the transmission run in oil in a casing which is dust proof.

The engine has two speeds forward and one reverse, 3¼ miles high speed, 2¼ low speed forward and 1¾ miles reverse at 600 revolutions of the engine. The speed can be changed as in any standard steam engine. The changing of the speed is so arranged that only one speed can be thrown in at a time, so that an inexperienced person cannot do any harm.

GASOLINE TRACTION ENGINE.

In this traction engine the power is conveyed from the transmission to the differential gear on the counter shaft, 4⅜ diameter, running in a saddle bearing, making both bearings as one piece. This always keeps the bearings in line, reduces the friction and extends the life of the machine. On the counter shaft are two master pinions geared to two master gears on the rear axle, and bolted to the hub of each rear wheel, making it double-drive. The rear axle runs in a saddle the same as the counter shaft, and although the rear has nothing to do but carry the load the diameter of the axle is 4 inches.

The frame is of 7 inches x 2½ inches x ½ inch channel steel, riveted together and strong enough to withstand three times the strain it will ever be called upon to sustain. The gears are protected against dirt and sand and run in hard oil. The radiator for cooling water is arranged so that the water is connected through the cylinders, then through pans above the radiator, finally reaching the radiator. The latter is cooled by the circulation of air caused by the

exhaust running in the stack above the radiator. A water supply tank is provided, and enough water is carried on the engine to last all day at hard work, such as plowing, without adding to the water supply. The gasoline fuel tank is large enough to last two days running. The whole device has been found simple and practical.

Novelties in the Postal and Telegraph Service.

The London postal authorities have inaugurated a unique service, known as the telephone post, by which letters received Saturday night may be delivered by telephone Sunday morning, thus avoiding a 24-hour delay. Almost at the same time comes the announcement of a new service by one of the American telegraph companies. When the telegram is received at the post office it is opened and read to addressee over the phone. The company proposes to transmit "night letters" by wire to distant points, the messages being typewritten by the receiving operator in the form of a letter and placed in the mail for delivery early in the morning. A 50-word letter will be sent in this way for the cost of a 10-word day despatch to the same point. In case a message is taken for a town where a night telegraph system is not maintained, it will be sent to the nearest night point and mailed or telephoned from there. These letters will be sent after midnight, when the wires are idle for the greater part of the time.

Highway Mirrors as Safeguards.

An English town lays claim to having the most novel danger sign in the world. At a narrow cross roads has been placed a large double mirror, so that drivers of approaching automobiles can see whether or not vehicles are coming from the other direction and govern themselves accordingly. The idea works so well that persons high in English motor circles are advocating the placing of such safeguards at all dangerous turns and corners.

AMENDMENT TO PATENT LAWS.

Department of the Interior,
United States Patent Office,
Washington, D. C., July 7, 1910.

Attention is directed to the following amendment to the laws relating to patents.

C. C BILLINGS,
Acting Commissioner.

[Public—No. 305. H. R. 24649.]

AN ACT To provide additional protection for owners of patents of the United States, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That whenever an invention described in and covered by a patent of the United States shall hereafter be used by the United States without license of the owner thereof or lawful right to use the same, such owner may recover reasonable compensation for such use by suit in the Court of Claims: *Provided, however*, That said Court of Claims shall not entertain a suit or award compensation under the provisions of this Act where the claim for compensation is based on the use by the United States of any article heretofore owned, leased, used by, or in the possession of the United States; *Provided, further*, That in any such suit the United States may avail itself of any and all defenses, general or special, which might be pleaded by a defendant in an action for infringement, as set forth in Title Sixty of the Revised Statutes, or otherwise: *And further provided*, That the benefits of this Act shall not inure to any patentee, who, when he makes such claim is in the employment or service of the Government of the United States; or the assignee of any such patentee; nor shall this Act apply to any device discovered or invented by such employee during the time of his employment or service.

Approved June 25, 1910.

Simplifying Our Money.

The Treasury Department has undertaken the heavy task of simplifying the national currency. Nineteen different designs for U. S. notes and coin certificates of various denominations have been in use in the past, and some of the designs on certificates of various denominations were so much alike as to cause confusion. For example the five dollar notes had two designs. The silver certificate bore the head of an Indian chief, while the United States note carried the portrait of Andrew Jackson, with a symbolical group of a frontiersman and family. The ten dollar gold certificate bore a portrait of Michael Hillegas, the first U. S. Treasurer, and the silver certificate of the same denomination carried the likeness of Thomas A. Hendricks. The ten dollar greenback was ornamented with a buffalo, and so on. In other denominations, the same variety existed. Under the new system, ten of the old designs are eliminated, and the remaining nine revised. In future all classes of notes of the same denomination will bear the same portrait, and no portrait will appear on notes of more than one denomination. Nor will any portrait be used which will not be immediately recognizable by every person who handles money.

How to Get Copies of Patents.

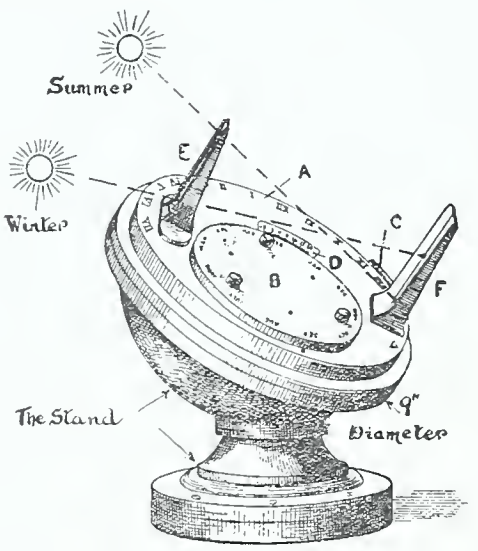
THE INVENTIVE AGE prints each month a list of the patents granted by the Patent Office. This list includes the name of the inventor, the title of the invention and the date of the patent. Anyone can procure through THE INVENTIVE AGE a copy of any patent included in the list, by giving the data and enclosing ten cents in stamps for each copy. There is no better way of keeping yourself informed about the progress of the arts, than by scanning the list each month and ordering copies of patents.

SUN CLOCK, OR HELIO-CHRONOMETER.

The accompanying illustrations show a new form of sun dial, called the helio-chronometer, largely used in England in gardens and parks and on terraces and balconies, offering means for finding the time without the calculations or allowances which were necessary with ordinary sun dials.

HELIO CHRONOMETER SET FOR 45° S.

This unique sun dial is of massive gun-metal and is supported by a vase like stand or on any convenient horizontal circuit. It is about 11 inches in height and the dial face is formed by two discs (see figures) engraved with the hours and months respectively. Minutes and days are distinguished on the sectors, the over-all diameter being about nine inches. The discs slide around easily and may thus be made to indicate any date and time.



HELIO-CHRONOMETER SHOWING DETAILS.

There are two screens, one being provided with two small holes through which the sun can cast a beam of light on the other, which has a central line engraved upon it. On the underside of one disc is an eccentric which acts on a lever attached to the screen, moving it to and fro. The instrument shows clock time and not sun time. In ordinary sun-dials the variation is more than half an hour in the course of a year. By fixing one sector at a suitable part of the circumference, the device is corrected in longitude and clock time shown.

Most people are aware of the defects of ordinary sun dials; minutes and seconds may be added or subtracted in varying numbers, according to the equation of time—other minutes and seconds must be allowed for the position of the dial in longitude, while there always remains the uncertainty as to where the shadow edge really is. The helio-chronometer affords every facility for adjustment in latitude and longitude. The operations are simple, and no special knowledge or skill is necessary. No place on the face of the earth is outside the range of this adjustment, while the instrument is easy to fix, never requires "mending" like a clock, and never "runs down." Its solidity obviates all risk of derangement in transit, the durability and accuracy remaining secure in any climate. Occasional absence of sunshine is no bar to the usefulness of a helio-chronometer. This, in conjunction with an ordinary clock in the house, is all that is necessary to make one's household quite independant of outside timekeepers, which are usually at variance among themselves.

In using the helio-chronometer, the year circle is set to the current date. Then the dial or hour circle is turned around by taking hold of the two finger grips so as to cause a spot of light through one of the holes in the moving screen to fall on the line engraved on the fixed screen. When the spot is bi-sected by the line, the correct time can be read at the sector on the periphery of the dial. It will be noted that the shadow of the gnomon, in the old-fashioned type of dial, is replaced by the spot of light, and thus far greater accuracy is attained.

The Tide as a Lever.

The work of removing a temporary railroad bridge coustructed of timbers for the erection of a modern steel bridge was recently accomplished on the Northern Pacific Railway without obstructing traffic for any great length of time. The bridge was over a river where the waters were affected by the tide from the Pacific Ocean. The temporary structure was swung lengthwise with the river early in the morning at low tide and large scows placed up under the old structure. Time was given for the tide to rise and lift the scows with the large wood structure, hoisting it from its place on the steel drum. After the rising tide had lifted the bridge from its position, work was resumed on the scows at once, the men knocking away the obstruction while the waters carried the structure one foot above the large steel drum. Two tug boats applied their power in pulling and pushing the scows out into the stream, after which they were towed to a point where the structure was loaded on two flat cars and carried to a place farther inland.

AIR-COOLED ELECTRIC DRILLS.

In operating large electric drills, it is necessary to support them in some satisfactory manner, and for this purpose both magnetic and mechanical devices have been designed. The accompanying illustration, Fig. 1, shows a double magnetic drilling pillar supporting a man and an electric drill, the combined weight being 210 pounds. For drilling I-beams, in structural work, and for operating on large castings where the surface is such that these magnetic pillars can be utilized to advantage, they are very successful. A simple and efficient means for supporting and operating heavy electric drills is indicated in illustration (Fig. 2.) and although this is a make-shift and temporary arrangement, it shows a simple method of operating the tool in an emergency.

FIG. 1.—DOUBLE MAGNETIC DRILLING PILLAR SUPPORTING MAN AND ELECTRIC DRILL WEIGHING 210 POUNDS.

The field for electrical tools for use on electric railway and tramway circuits of from 500 to 650 volts is a very extensive one, and a drill for high voltage circuits has now been perfected and proved valuable for this class of work. The old method of ratching or drilling holes by hand power track drills is too slow and expensive. It is a very simple matter to take current from the trolley wire or third rail in order to operate an electric drill, and the work can be accomplished in one-tenth the time formerly required. As it weighs only 35 pounds it can be easily handled, and special precautions have been taken to make its use absolutely safe on 550 volt circuits. The device illustrated is capable of drilling holes in steel up to one inch in diameter. It is provided with two cables, one for connection to the ground rail and the other for connection to the trolley wire or third rail, as the case may be.

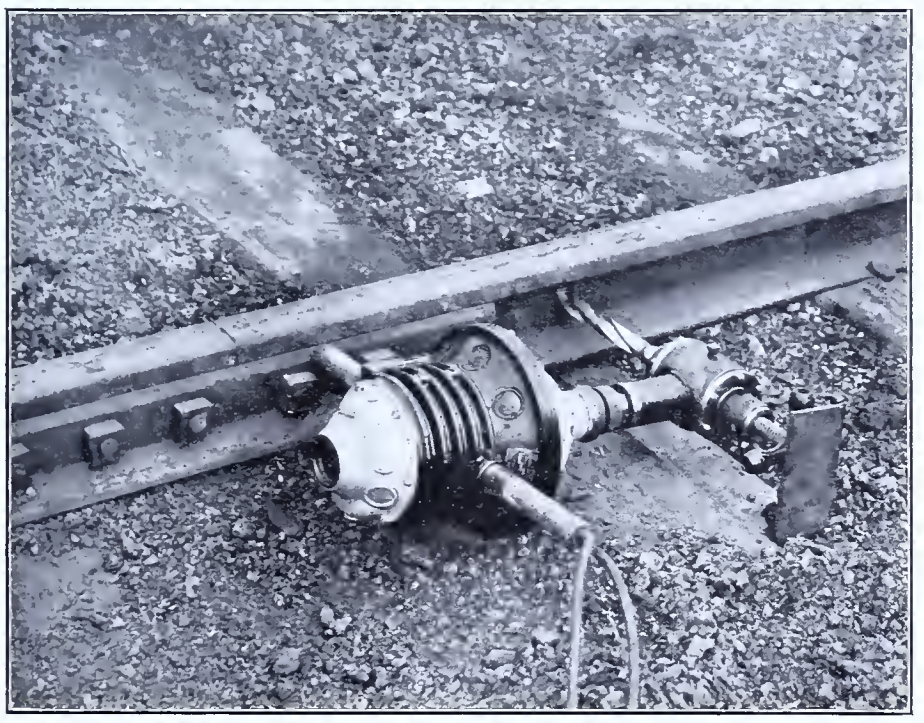


FIG. 2 —DRILL SUPPORT.

It may be of interest to note the construction of the direct current air-cooled electric drills of the three armature type, as shown in operation in Fig. 1.

It is stated that this drill with three revolving armatures has met with a very favorable reception. chiefly in the heavier classes of work. A large number of these are in operation in boiler shops and ship yards in England and America. The particular advantage of this drill lies in its ability to do heavy work with rapidity, and it has proved a successful rival to the larger sizes of pneumatic drills. The use of these armatures permits a very compact and neat mechanical structure, with the feed screw placed in the center of the triangle armature. The three armatures being so comparatively small in size can be operated at a fairly high speed, which dissipates the heat generated in the tool.

It may be stated that the armatures are provided with ventilating fans. The flux is in series through the three field cores and armatures, thereby insuring the development of equal power by each armature. This feature is essential to the successful operation of any tool having two or more armatures geared to one system of gearing.

The direct current air-cooled electric drill of the three-armature type is wound for 110 and 220 volt direct current, and is utilized to special advantage for drilling, tapping and reaming, and also for tube expanding.

Live Fish on Shipboard.

The standing joke on an ocean voyage when fish are served at a meal, about their having been "just caught" has lost its element of humor. The experiment of carrying live fish in tanks on shipboard has been successful, and it is now assured that among the other luxuries provided on the palatial liners will be fish fresh from the water to tempt the appetite of the passengers. It was a disputed question whether the fish would withstand the fatigue of the voyage, but tests made on one of the largest boats plying the Atlantic showed conclusively that the plan was entirely feasible. Heretofore it has been the custom to store fish for consumption during the voyage in ice, but it will be a decided advantage to have fresh fish served at table.

An Illuminating Bomb.

Modern warfare employs some curious weapons. There are the submarines, the aerial engines of destruction, and the torpedoes that work with such judgement and accuraey that the superstitious might be pardoned for thinking that each one was inhabited by a demon. The War Department has also been making experiments with an "illuminating bomb" so-called, which in reality is not a bomb at all, but a sort of pyrotechnic contrivance attached to shells thrown by rifled guns and mortars. The bomb is a small cylinder of brass, two inches in length, which is screwed into the base of the projectile. It is filled with perhaps two ounces of a composition that burns with high illuminating power. When the shell is discharged, the explosion of the powder in the gun ignites a fuse attached to the composition in the cylinder, which is then consumed with a bright light and considerable smoke.

Though the quantity of the mixture in the cylinder is so small, it burns long enough to last until the projectile strikes the target, even if the latter is several miles distant. At night its combustion makes a brilliant spot of flame, which, accompanying the projectile, enables ihe observer to see exactly the course taken by the shell. In the day time the smoke serves an equivalent purpose.

Though important for study, where ordnance officers are taking note of the flght of projectiles, the illuminating bomb seems likely to prove useful in actual warfare, enabling the officer in charge of a gun or battery to see how the shells strike, whether they hit or miss the object aimed at. Thus, either by day or by night, judging by the smoke or by the flame shown, the range can be judged, the elevation of the weapon modified, and the aim adjusted with accuracy, even though the target may be far away.

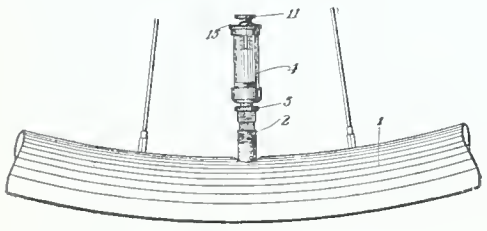
Recently some attention has been aroused in Europe by experiments with illuminating bombs of various kinds, one of which, when cast among the enemy at night, bursts and immediately lights up the darkness with a power of one hundred thousand candles, thus revealing the situation of the opposing force. Not less remarkable are the smoke grenades, filled with chemical substances, which on explosion produce clouds of dense black vapor. These are intended to be carried in advance by skirmishers and thrown so as to conceal the troops following.

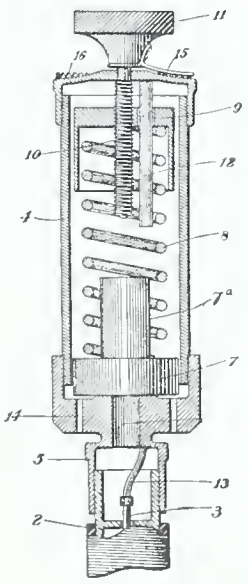
CLEVER NEW PATENTS.

Pneumatic Safety Valve.—Stove Pipe Attachment.—Pin.—Finger Ring.

Pneumatic Safety Valve.

The extensive and rapidly growing use of automobiles gives special interest to an invention of Frank Moyle, of Jamestown, Cal. It relates to safety valves for pneumatic tires, such as are employed on bicycles as well as motor vehicles, and it provides means whereby the air within the tire will be automatically relieved when expanded by heat or other cause, thus lessening the interior strain and preventing bursting or tearing of the tires. The device, which is here illustrated, (the cuts showing a portion of a tire with the valve installed thereon, and a vertical section of the valve itself), consists of a tube 4 having a sleeve adapted to screw onto the usual valve tube of the tire. A port effects communication between the two tubes, and over said port is seated a valve 7. A spring 8 is interposed between said valve and the cap 9, which is screw mounted on the threaded pin 10, operated by a thumb screw cap 11 on the outside of the tube 4. The cap is prevented from rotary movement by the pin 12 projecting from the top of

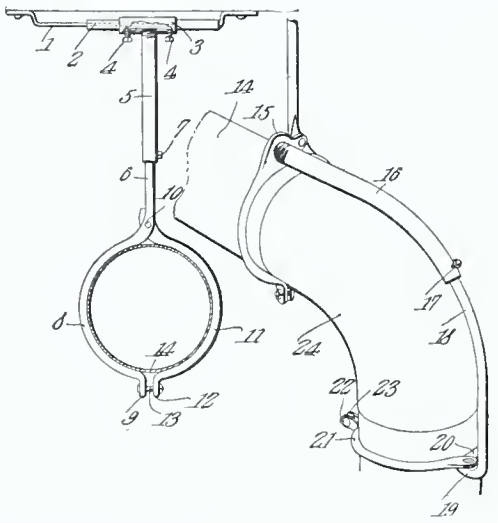




the tube through said cap. When the tire is pumped up, the sleeve is screwed onto the tube 2, a pin 13 therein engaging the relief pin 3 and permitting air pressure to pass through the port against the valve 7, the spring 8 being of sufficient tension to hold the normal pressure of the air; but when the same becomes expanded from heat, the added pressure raises the valve 7 and permits the air to escape through ports 14 in the tube 4. The tension of the spring is decreased or increased by screwing the cap up or down on the pin 10, thus allowing accurate adjustment. The valve has a shank 7*a* extending up into the spring to hold the latter in proper position. To prevent the cap 9 from being moved by accident, a circular ratchet rack 16 is provided on the top of the tube, which is engageable with the spring 15, which latter is secured to the member 11 to hold it against undesired movement.

Stove Pipe Attachment.

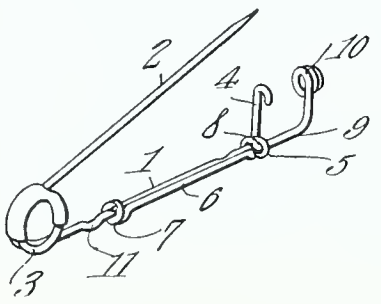
Those who have struggled with recalcitrant stovepipes will welcome a device recently patented, for supporting the pipe firmly at any desired distance from the wall or ceiling. The invention is by Chas. D. Pearce, of Canton, Mo., and the illustrations show a perspective view of the device

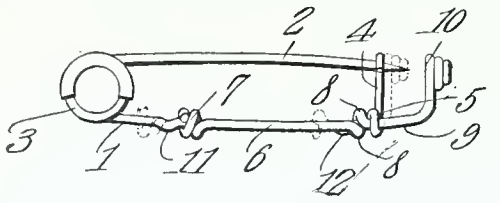


applied to a vertical elbow, and a side elevation, partly broken away, of the same applied to a straight length of pipe. A bracket is secured to the wall consisting of telescoping members 1 and 2, which may be drawn out or pushed together so as to accomodate the device to any unevenness. A sleeve 3, mounted on the bracket, has a threaded opening to receive the upper end of the tube 5, which receives the rod 6, the latter being secured at any desired point. The lower part of the rod is bent to provide a semi-circular clamping member 8 having a depending lug 9 at its extremity. A co-acting clamping member 11 is pivoted to the rod, and has a depending lug 12 at its lower end, through which a fastening bolt 13 is inserted to secure the two members around a stove pipe, as shown in the cut. When it is wished to accomodate an elbow, a second pair of clamping members, similar to the one just described, is employed. The member 11 is provided with a lateral ear 15 having a threaded perforation in which is secured the end of a second supporting bar, said bar comprising a curved tubular arm 16, with a set screw at its outer end. In this arm is a curved rod 18 with one end bent at right angles and then curved laterally to form a semi-circular clamping member 20. To the end 19 of the rod a co-acting clamping member is pivoted, and the members are bolted together. It will thus be seen that a clamp is provided at each end of the elbow, and these clamps are connected by a curved member which follows the curvature of the elbow so as to hold the same rigid and prevent its disengagement from the stove pipe. To use the invention, the bracket is placed on the wall or ceiling, and the tubular members of the hanger secured in the sleeves 3. The clamping members 8 and 11 are then fastened around the lengths of pipe and the rods 6 inserted into the tubular members 5 and secured so as to support the pipe in the desired position.

Pin.

Millions and millions of pins are manufactured every year, but the supply never seems to catch up with the demand. There is no article more generally employed than this simple little device. Safety pins, too, are generally appreciated, and this line is open to greater variety in construction than the plain and common pin. A novelty in this direction is shown in an invention by John H. Reed, of Lancaster, Wisc., which consists in providing a movable guard to incase the point of the pin. The device is shown in the cuts, both open and closed, with the guard cap ready to engage with the point of the pin. On the free end of the shank—which is connected with the pin in the usual manner—is an upstanding hook or catch 4 to engage with the pin at its pointed end. The catch has an eye 5 which loosely engages the shank of the movable guard member. The latter embodies a shank portion 6 parallel with the shank of the pin, and terminating at one end in an eye 7 that loosely engages the shank and at the other in an eye 8 which engages the shank of the adjacent the base eye 5 of the catch. The outer eye 8 acts as a stop for contact with the base eye of the catch, whereby the outward movement of the guard member is limited. The shank of the guard is extended and terminates in a cap, which incases the point of the pin when the latter is closed. Crimps 11 and 12 are provided on the pin shank, and are so spaced

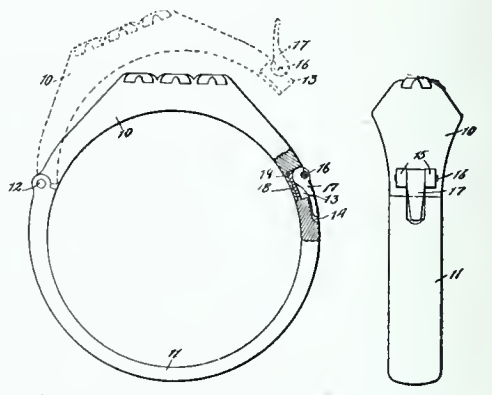




that the eyes 7 and 8 spring over and engage one side of the crimps when the cap is in engagement with the pin point. The guard is thus yieldingly held in this position until the eyes of its shank are forced back over the crimps carried by the shank of the safety pin, when the guard will be moved forward and the cap disengaged from the point. These crimps prevent turning of the guard on the shank of the pin, so that the guard cap will be held in the same relative position to the hook or catch at all times.

Finger Ring.

A ring that can be put on and taken off without slipping over the knuckle, (which is sometimes too large to permit the ring to fit snugly when once in place) has been invented by Nathan W. Moody, of Sanger, Cal. The ring is made in sections hinged together, and there is a novel fastening device by which the ring is held firmly as one piece, though it may be quickly separated without the aid of any special implement for this purpose. The drawings show a side and edge view of the ring, the dotted lines indi-



cating its appearance when opened. It will be seen that the two sections are hinged together so as to permit them to be opened so that the finger can be inserted. One section is larger than the other, so that the ring will have sufficient hold on the finger to remain in place while the small section is being clamped into position. A cam lever 17 swings on a pivot pin 16, and can be turned so as to afford clearance between it and the bottom of the recess 13. The tongue 18 on the end of the long section is adapted to fit snugly within this recess when the two sections are in the position shown in the second figure, with the cam lever 18 turned to allow the greatest clearance possible, such clearance being necessary on account of the enlarged end 19 of such tongue. When the sections are thus brought together, with the hooked end of the tongue held against the end of the recess 13, the cam lever is turned down, its free end fitting in the recess 14 of the long section, and the curvature of the lever then corresponding with that of the end 19, thus clamping the parts tightly together. To remove the ring, the lever 17 is turned on its pivot so as to clear the end 19 of the tongue, and the ring is then spread apart. This makes it possible for anyone to wear a close fitting ring, and to remove it from the finger promptly, when desired.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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E. H. ANGLE REGULATING APPLIANCE CO. et al. v. ADERER.

(Circuit Court S. D. New York. June 23, 1909. 171 F. R. p. 93.)

PATENTS — INFRINGEMENT--FEATURES DISCLOSED, BUT NOT CLAIMED.

A patentee is entitled to the benefit accruing from a characteristic of his device which is clearly disclosed, although not specifically claimed.

HESS-BRIGHT MFG. CO. et al. v. STANDARD ROLLER BEARING CO.

(Circuit Court, E. D. Pennsylvania. June 26, 1909. 171 F. R. p. 114.)

PATENTS—PERSONS ENTITLED TO PATENTS—EFFECT OF PRIOR APPLICATION IN FOREIGN COUNTRY—CONSTRUCTION OF STATUTE—COMPUTATION OF TIME.

In computing time under Rev. St. § 4887, as amended by Act March 3, 1903, c. 1019, 32 Stat. 1225 (U. S. Comp. St. Supp. 1907, p. 1003), permitting the filing of an application for a patent in this country within 12 months after the filing of an application for a patent for the same invention in a foreign country, the day of the application in the foreign country is excluded, and where the foreign application was filed on February 23d, an application filed in this country on February 23d of the following year was in time.

UNDERWOOD TYPEWRITER CO. v. ELLIOTT-FISHER CO.

Circuit Court, S. D. New York. July 12, 1909. 171 F. R. p. 116.)

PATENTS — SUIT FOR INFRINGEMENT—DAMAGES AND PROFITS—PROOF OF MARKING OR NOTICE.

Where in a suit for infringement of a patent, the bill alleges the marking of the patented article as required by Rev. St. § 4900 (U. S. Comp. St. 1901, p. 3388), or notice to defendant of infringement, the court may permit proof of such allegations at any time before final decree, even on an accounting before the master after an interlocutory decree, in order to carry the accounting back of the filing of the bill, where equity requires it, as where, although the issue was tendered by the bill, the point was not raised on the hearing and no proof was introduced thereon.

FLORENCE MFG. CO. v. DOWD et al.

(Circuit Court, S. D. New York. June 23, 1909. 171 F. R. p. 122.)

1. TRADE - MARKS AND TRADE - NAMES—MARKS SUBJECT TO APPROPRIATION—DESCRIPTIVE NAMES.

The word "Keepclean" as a name for toilet brushes is desoriptive and cannot be appropriated as a trade-mark.

2. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION.

To entitle a manufacturer to an injunction to prevent a competitor from imitating a name used by him to designate his goods which is descriptive, and therefore not a valid trade-mark, the imitation must be with fraudulent intent or such as is calculated to deceive the public.

THOMAS G. CARROLL & SON CO. v. McILVAINE & BALDWIN, Inc.

(Circuit Court, S. D. New York. June 23, 1909. 171 F. R. p. 125.)

1. TRADE-MARKS AND TRADE-NAMES-TITLE—EFFECT OF REGISTRATION.

Registration of a trade-mark cannot confer title, if some other individual by prior adoption and use has acquired a common-law title.

2. TRADE-MARKS AND TRADE-NAMES-TITLE—CONTEMPORANEOUS USE.

Where the same trade-mark is used by different persons in the same line of business, and operating partly at least in the same territory, the exclusive use is awarded to him who first devised and used the same, provided he asserts his rights without laches.

3. TRADE-MARKS AND TRADE-NAMES-TITLE—"BALTIMORE CLUB" WHISKEY.

The right to the use of the name "Baltimore Club" as a trade-mark for rye whiskey held to be in defendant on the ground of prior use, although both parties had used it continuously for many years, but in different localities.

4. TRADE-MARKS AND TRADE-NAMES—NATURE.

A trade-mark merely distinguishes and designates the business in which it is used, and it is the business which is to be protected, and not the trade-mark as a mere collocation of words or symbols.

5. TRADE-MARKS AND TRADE-NAMES—INFRINGEMENT—RIGHT TO INJUNCTION.

Complainant and its predecessors in Baltimore, and defendant and its predecessors in New York City, each for more than 30 years produced and sold a rye whiskey under the name of "Baltimore Club." Complainant's business was chiefly local, and did not extend to New York City until shortly before the commencement of this suit, when it placed its goods in the market there. Defendant's business was larger, and whatever reputation or value attached to the name in New York was due to its efforts and its goods, Held, that complainant, even if conceded priority of use in the limited area of its business, had no standing to enjoin defendant's use in New York, since that would be to further the deception of the public there, which it is the primary object of equity in such cases to prevent.

SEEGER REFRIGERATOR CO. v. AMERICAN CAR & FOUNDRY CO.

(Circuit Court, D. New Jersey. Jan. 21, 1909. 171 F. R. p. 416.)

1. PATENTS — INFRINGEMENT — CHANGE IN FORM OF PARTS.

Infringement is shown where the alleged infringing device operates on the same principle as that of the patent, and accomplishes the same result in substantially the same way by equivalent means; the only difference being in the form or proportions of the parts.

2. PATENTS—VALIDITY AND INFRINGEMENT—REFRIGERATOR.

The Quinn patent, No. 539,009, for a combined refrigerator and freezer, the important feature of which is a series of ports in the partition between the ice bunker and food chamber, which by siphonic action causes a continuous circulation of air in the refrigerator, was not anticipated, and discloses invention; nor is it limited by a change in the wording of the claims made at the suggestion of the examiner in the Patent Office the effect of which was merely to more specifically define the invention; also held infringed by the refrigerator of the Ames patent, No. 635,309, which adopted the principle of the Quinn invention, with only some changes in the form of the ventilating ports.

3. CORPORATIONS—EQUITABLE ESTOPPEL—NOTICE TO CORPORATION.

Notice of matters to create an estoppel may be imputed to a corporation where the facts were known to all of the corporators, but not because they were known to some of them only.

JUENGST v. GULLBERG et al.

(Circuit Court, S. D. New York. June 7, 1909. 171 F. R. p. 428.)

1. PATENTS—INFRINGEMENT—IMPROVEMENT PATENT.

Where a patent does not embody a primary invention, but only an improvement on the prior art, and the defendant's machine can be differentiated, the charge of infringement is not sustained.

2. PATENTS — INFRINGEMENT — SIGNATURE GATHERING MACHINE.

The Juengst patent, No. 761,496, for a signature gathering machine, discloses patentable invention but is an improvement patent, limited by the prior art to the single novel feature of the adjustability of the gripper jaws. As so construed, held not infringed.

BROWN BAG-FILLING MACH. CO. v. DROHEN.

(Circuit Court, W. D. New York. Feb. 23, 1909. 171 F. R. p. 438.)

1. PATENTS — SUIT FOR INFRINGEMENT — MEASURE OF PROFITS.

In computing the profits realized by a defendant from the use of an infringing bag-filling machine, the master held to have properly taken as the basis the saving as compared with the cost of hand labor, and that the work was even then done at a loss is immaterial.

2. PATENTS — SUIT FOR INFRINGEMENT—REFERENCE FOR ACCOUNTING.

The question whether a defendant, after an interlocutory decree finding infringement of a patent, further infringed by the use of machines not before the court, is one which may properly be determined by the master on an accounting.

3. PATENTS-SUIT FOR INFRINGEMENT-RIGHT TO DAMAGES.

Where there is not sufficient evidence to establish a uniform license fee or royalty for the use of a patented machine, a master is justified in refusing to award damages for the use of an infringing machine.

SIROCCO ENGINEERING CO. v. B. F. STURTEVANT CO.

(Circuit Court, S. D. New York. June 12, 1909. 171 F. R. p. 440.)

1. PATENTS—SUIT FOR INFRINGEMENT—REISSUE.

A delay of seven years before applying for a reissue raises a presumption of laches, and imposes the burden upon the complainant, in a suit for infringement of the reissue, to allege and prove facts in excuse.

2. PATENTS—REISSUES— CONSTRUCTION OF CLAIMS.

On demurrer, claims in a reissue patent should not be regarded as the same as those in the original patent, although in identical words, where the specifications are different, and the bill does not show that the changes in the specifications make no material change in the scope of the claim.

NATIONAL MALLEABLE CASTINGS CO. v. BUCKEYE MALLEABLE IRON & COUPLER CO. et al.

(Circuit Court of Appeals, Sixth Circuit. July 7, 1909. 171 F. R. p. 847.)

1. PATENTS — CONSTRUCTION — PAPER PATENTS.

While the fact that a patented device has never gone into use does not defeat the patent, it warrants an inference against utility, the converse of that which arises from successful commercial use, and may justify a narrow construction of the patent.

2. PATENTS—INFRINGEMENT-CAR COUPLER.

The Deitz patent, No. 576,,094, for a car coupler, involves invention and is valid, but is an improvement patent in a crowded art and must be narrowly construed As so construed, held not infringed.

DUNER CO. v. GRAND RAPIDS R. CO.

(Circuit Court of Appeals, Sixth Circuit. June 29, 1909. 171 F. R. p. 863.)

1. PATENTS—INVENTION--CHANGE IN MOVABILITY OF PARTS.

Making one of two coacting parts stationary and the other movable, where before the first had been movable and the second stationary, does not amount to invention.

2. PATENTS—INFRINGEMENT — SAND-BOXES FOR CARS.

The Duner patent, No. 639,891, for a sand-box for cars, claim 3, given the only construction which will save it from anticipation, held not infringed.

AMERICAN LAUNDRY MACHINERY MFG. CO. v. TROY LAUNDRY MACHINERY CO., Limited.

(Circuit Court, N. D. New York. July 21, 1909. 171 F. R. p. 870.)

1. PATENTS — INVENTION—COMBINATION OF OLD ELEMENTS.

If ordinary mechanical skill is adequate to make the selection of elements from machines in the prior art and their union or combination in a new machine, operating in the old way and accomplishing the same result, although it may be an improved result, and no new idea is involved in the process, there is no patentable invention, however great the improvement.

2. PATENTS-INVENTION-IRONING-MACHINES.

The Wendell patent, No. 466,815, for an ironing-machine, is void for lack of patentable invention in view of the prior art.

AMERICAN LAUNDRY MACHINERY MFG. CO. v. TROY LAUNDRY MACHINERY CO., Limited.

(Circuit Court, N. D. New York. July 21, 1909. 171 F. R. p. 878.)

1. PATENTS — VALIDITY AND INFRINGEMENT—CLOTHES DRIER.

The Barnes patent, No. 684,776, for a clothes-drier, consisting of a drying room through which the clothes are moved on a conveyer, was not anticipated, and is for a new combination of old elements, which by a new mode of operation produces an improved result and discloses patentable invention. Also, held infringed.

2. PATENTS — VALIDITY AND INFRINGEMENT — CLOTHES DRIER.

The Hagen & Cooper patent, No. 735,366, for improvements in clothes driers of the endless conveyer type, the improvements being in the conveyer, was not anticipated, and discloses invention. Also, held infringed.

FONOTIPIA LIMITED et al. v. BRADLEY.

VICTOR TALKING MACH. CO. v. SAME.

(Circuit Court, E. D. New York. August 7, 1909. 171 F. R. p. 951.)

1. TRADE-MARKS AND TRADE-NAMES—INFRINGEMENT—IMITATION.

A red seal or label, containing a trade-mark, placed in the center of a talking machine disc record, is not imitated so as to give the maker a remedy in equity for infringement of trade-mark by reason of the placing by another manufacturer of a label in the same place on his discs, or because it is surrounded by a red band, where it has no other resemblance to complainants'.

2. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—RIGHT TO MAINTAIN SUIT.

The fact that an article is made under a patent, and that the manufacturer might have a remedy against another manufacturer for infringement of such patent, does not preclude him from maintaining a suit against such manufacturer for unfair competition.

ALBERS BROS. MILLING CO. v. ACME MILLS CO.

(Circuit Court, D. Oregon. July 19, 1909 171 F. R. p. 989.)

TRADE-MARKS AND TRADE-NAMES—WORDS SUBJECT TO APPROPRIATION—PREVIOUS USE IN DESCRIPTIVE SENSE.

The word "cream," where not previously used in that connection, may be appropriately adopted by a manufacturer as a trade-mark for a superior brand of rolled oats made by him; but its prior use by other manufacturers generally as a descriptive term to denote the first quality, either alone or in combination in the term "extra cream," in which sense it had come to be understood in the trade, would preclude its exclusive appropriation as a trade-mark by any one manufacturer.

UNION CARBIDE CO. v. AMERICAN CARBIDE CO.

(Circuit Court, N. D. New York. August 2, 1909. 172 F. R. p. 120.)

1. PATENTS — PRIOR PUBLIC USE—WHAT CONSTITUTES—EXPERIMENTAL USE.

An experimental use of a new invention or discovery, which will not defeat the right of the inventor to a patent unless application is made within two years, must have been in perfecting the invention, and where the discoverer of a new form of calcium carbide, who made a considerable quantity, used the same in experiments in making acetylene gas, etc., not for the purpose of perfecting it, but to demonstrate its commercial value, and also sent a quantity abroad without injunctions of secrecy or restrictions upon its use, where it was used for like purposes, such use constituted a public use or disclosure within the meaning of the law.

2. PATENTS—PRIOR PUBLIC USE—TIME OF APPLICATION — SUCCESSIVE APPLICATIONS.

The discoverer of a new form of a chemical product made an application for a broad patent thereon, which was rejected, and he afterward, but more than two years after his product had been in public use, made a new application for a more limited patent, which after various amendments was granted. Held, that the second application was a continuation of the first in such sense as to take the case out of the limitation of the statute, the product which was the subject of both applications being the same.

3. PATENTS-VALIDITY—INFRINGEMENT- CRYSTALLINE CALCIUM CARBIDE.

The Wilson patent, No. 541,138, covering "as a new product crystalline calcium carbide existing as masses of aggregated crystals," is valid, but is limited to the one form of crystalline carbide "existing in masses of aggregated crystals," and does not include other forms which had been previously produced. As so construed, held not infringed.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Randolph N. Martz, Frederick, Md. Wagon. — The main object of the present invention is to provide a wagon of the type known as "eight-wheel wagons," capable of transporting heavy objects, such as logs, timbers, metallic beams and the like, and constructed so as to permit the passage of the vehicle over rough and uneven ground without effecting the localization of abnormal or undue strain, thereby avoiding the racking of the structure and the transmission of shocks to the draft animals.

Randolph N. Martz, Frederick, Md. Wagon.—The principal object of this invention is to provide an improved eight-wheel wagon, in which when one or more wheels encounter an obstacle, or become stalled in a rut, the two sets of wheels on the same truck may be cramped in order that the wheels may be freed. Another object is to provide means whereby the throw of the wagon tongue may be raised with reference to the truck. When horses are used little play is required, but when the wagon is propelled by oxen, considerably more play is required, and this is done by spacing several bolts.

Randolph N. Martz, Frederick, Md. Vehicle.—The principal object of this invention is to provide an eight-wheel wagon, with a coupling which is so connected to the trucks that the turning of said trucks will effect no variation of distance between the bolsters, and consequently no shifting of the load will take place on the latter. Another object is to provide a coupler which is separate from the bolsters, so that it will not interfere with their movement. and which will permit the employment of the vehicle with or without them.

Randolph N. Martz, Frederick, Md. Vehicle Brake.—The object of this invention is to provide a simple, inexpensive and efficient brake of great strength and durability, designed particularly for use on farm wagons, and capable of being applied from either the front, back, or side of the vehicle with equal effectiveness, and which can be readily adjusted without change to different vehicles of a standard gage, and having means whereby the wear of the brake shoes may be taken up.

W. E. Zabst, Portage, Wisconsin. Telephone System.—The primary object of the present invention is to provide a party line telephone system with a call mechanism whereby any party desired can be called by central, or by any other party, without the signal bells of all or any other of the subscribers on the same line being operated, thus providing a system which will obviate the ringing of all the subscribers' bells when a particular party is called, and also doing away with the listening of one party when others are talking over the line. Another object is to provide means in the form of an attachment that can be applied to practically any style of instrument, without changing in any manner the electrical features of the instrument or the lines with which it is connected.

W. E. Zabst, Portage, Wisconsin. Telephone System.—The principal object of this invention is to provide a selective call telephone system wherein the selector for the particular subscriber to be called is located in the bell box of the phone. Another object is to provide a selector which is easily and quickly operated, and to provide means by which the selectors of the remainder of the line are not disturbed when a particular party is called by the central operator.

W. E. Zabst, Portage, Wisconsin. Telephone System.—The main object of this invention is to provide an extremely simple control mechanism whereby all the ringing signals of all the subscribers' telephone sets, other than those of the calling and called subscribers, are locked out of use so that the likelihood of eaves-dropping is minimized and only the two subscribers involved in the call are aware of the fact that the line is busy.

George H. Houck, Tonawanda, N. Y. Bicycle Handle Bar.—The main object of this device is to provide an attachment for bicycle handle bars, whereby the handle bars may be easily and readily detached from the head-post, may be readily adjusted to different angles and elevations, and may be connected to any head-post of the well known type; and which will position the handle bars nearer the rider and at the same time provide a greater leverage in turning the front wheel.

Anton Linnemeyer, Quincy, Ill. Safety Elevator. — The invention covered by this patent is an elevator car, provided with a means whereby the elevator can be stopped and held in case the supporting cable breaks, or any of the mechanism becomes deranged, thus preventing loss of life consequent upon the elevator car falling from a great height. Means are provided whereby the downward movement of the car may be stopped by the elevator operator instantly and without the sudden shock or jar which is so common in all mechanisms of this kind.

Sidney F. Fawcett, Centralia, Mo. Wall Paper Hanger.—This is a very useful device for paperhangers. Its object is to provide a device which will carry the paper roll, carry and apply the paste, and apply the pasted paper smoothly and evenly to the walls or ceiling, means being provided whereby the amount of paste to be applied to the paper may be quickly regulated.

Joseph J. Atkinson, Houston, Tex. Filing Cabinet.—This invention has for its object to provide a filing case, which may be used to form a unit with other cabinets for the production of a complete filing case of any desired size, and to provide a case in which the division plates dividing the classified materials may be easily turned downward, to permit the matter contained between the division plates or cards to be easily gotten at or withdrawn. The division plates may be supported in position and held snugly against the contents of the case, while, at the same time, these holding means may be easily removed and placed at any position in the case to allow for the expansion in the material contained within the case.

Charles A. Maher, Denver, Colo. Eye Cup.—The inventor's aim is to provide a combined eye cup and dropper by the use of which medicament may be taken from a bottle and introduced into the eye without exposure to the outside air. The article is made out of a material which will readily conform to the socket of the eye, and at the same time will be cheap in construction and will not be affected by the action of the medicament.

Louie A. Thomas, Aurora, Iowa. Cement Mortar Mixer.—This is a very simple and efficient device for use in the making of concrete or mortar, and its main object is to provide a system of gears, whereby the various feeding means may be rotated at different speeds and separate from each other. Another object is to provide means whereby the feed mechanisms and mixing drum are rotated by the same elements but independently of each other.

Mary B. Veitch, Administratrix of Richard C. Veitch, deceased, Ensley, Ala. Car Tilting Device.—This invention has for its object to provide a simpler, more efficient and less expensive means for transporting and dumping cinders from blast furnaces and the like than has been heretofore provided. A ladle is mounted in bearings on a pair of trucks and has one shaft geared to the wheels of one of the trucks in such a manner that by throwing the clutch when the car is in motion, the ladle may be either dumped or righted. The ladle may be held in any tilted position desired, and is under the complete control of the operator.

Charles W. Harvey, New Brunswick, N. J. Grate.—This invention relates to dumping grates, and has for its object to provide a structure that can be readily installed without the necessity of mounting it in the furnace walls, and without weakening or altering such walls. Another object is to provide a grate, wherein the bars are made of readily insertible and detachable parts, so that the grate can be easily varied to suit the different grades and character of fuel, and in case of injury the particular part can be removed and replaced without the necessity of inserting an entirely new grate and without requiring the dismemberment of the entire structure.

Alfred R. Cunnius, Brooklyn, N. Y. Graphophone Horn.—The invention relates particularly to the construction of graphophone horns, and especially to that class of horns which are made of material other than metal. One of the principal features of this invention is the joining of the several sections of veneer in such a manner that the joints furnish an ornamental effect.

Alfred R. Cunnius, Brooklyn, N. Y., inventor; Lipman Kaiser, assignee of one half, E. Orange, N. J. Phonograph Horn.—The object of this invention is to provide a horn made up of thin strips or sections interengaged at their edges, bound to each other by doubled dove-tailed dowels, and by transverse strips or bars let into the sections and crossing the same, the ends of the sections being further prevented from splitting by inserts of wooden strips transverse in grain to the grain of the sections. In this manner strengthening means are provided which will be ornamental and will take a high polish.

Dewitt Spensley, Aurora, Iowa. Riding Attachment for Agriculture Implements.—The principal object of this invention is to provide a structure which trails after the harrow or other implement, wherein the wheels or other ground support for the seat may follow the unevenness of the ground without tilting said seat, thus avoiding the danger of unseating the driver where the surface is rough. The improvement consists in pivotally mounting the frame carrying the driver's seat on the frame to which the wheels are attached, thus allowing an independent movement of the lower and upper frames.

Charles H. Magruder, Shelbina, Mo. Rail Support.—This device relates to rail supports to prevent the lateral spreading of the rails, and is adapted to be secured between any desired pair of ties. It includes rail clamping members which are oppositely arranged on the outside of the rails and between a pair of ties, and are securely clamped to the rails by a tie bar, said bar being arranged on a support which also prevents the rails from being drawn too close when applying the clamp.

James Petrie, Rossland, B. C., Canada. Drilling Machine. — The main object of this invention is to provide a packing holder for drill pistons, which will at all times keep the packing tight around the piston. To accomplish this the inventor has provided a pair of tapered semi-circular sections, which carry the packing and surround the piston rod. Encircling these sections is a sleeve or collar which is drawn toward the large end of these sections by spring pressed means, and thus tightly forces the packing against the piston.

John A. Myers, Braddock, Pa. Spindle Joint for Automobiles.—The object of this invention is to provide a two-part spindle for steering vehicle wheels, which is adapted to have pivotal engagement with the axle and be held in its engagement therewith by an enclosing rotatable hub, and further to provide a hub which is rotatable around the spindle in ball bearings.

William H. Whitney, Kewanee, Ill., inventor; Benj. J. Orendorff, same place, assignee of one half. Surveying Instrument.—The object of this invention is to provide a means whereby distances, altitudes, and the like may be readily ascertained by means of triangulation, without the necessity of actually measuring said distances by chains or other analogous instruments. The device comprises a compass mounted on a tripod, together with the necessary marked frame, measuring levers and sights which are mounted on the legs of the tripod. By the proper manipulation of the same any distance or altitude may be ascertained.

Wm. W. Wonner, inventor, York, Pa.; Mearl E. Kunkel, Rossville, Pa., assignee of one half. Electric Steam Generator.—This structure is intended to do away with the fire pots in boilers, the water being heated by electricity. The main object is to provide suitable electrode holding and advancing means, whereby a uniform arc of high temperature will be maintained. The device may be used with any tubular boiler without making any material alterations in the same.

Charles E. Klink, Lemoyne, Pa., and Charles H. Herzog, Detroit, Mich. Milling Cutter Sharpening Device.—The primary object of this invention is to provide novel means for sharpening angular milling cutters by grinding the relief surfaces of the teeth thereof, the means being readily applicable to practically any grinding machine. Another object is to provide means by which every tooth of a milling cutter may be ground to the same length so that all will cut, resulting in a mill that can be run at a high rate of speed and with a higher degree of efficiency than at present.

Elmer A. Ross, Comstock, N. Y., inventor; Dorus C. Boscune, assignee of one-fourth, Ticonderoga, N. Y. Ore Separator.—The inventor's aim is to provide a device for separating finely cominuted ores, and one that can be continuously operated and will effect the complete and proper separation and grading of the ore delivered thereto, said structure automatically discharging the different grades of ore as predetermined quantities thereof accumulate.

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FOR SALE — Patent No. 951,920. Adjustable sawing machine, for sawing perfect circles. Can be manufactured at small cost. Will sell outright or part cash and royalty. Address, Doc H. Smith, Moundridge, Kansas. oct

FOR SALE or on royalty—U. S. Patent No. 935,342, issued Sept. 28, 1909: Canadian patent No. 124,511, March 15, 1910. Novelty skein holder. Its purpose is to hold silk skeins of thread straight, clean and convenient. One strand of thread can be drawn out without disturbing the others. Saleable wherever silk embroidery is used. For particulars, write Fred E. Weightze, 1246 Champa St., Denver, Colo. sep

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WASHINGTON, D. C., SEPTEMBER 1, 1910.

NEW LEGISLATION.

Government Must Pay for Right to Use Patents.

In another section of this edition, we print in full the amendment to the patent laws passed by the last Congress, to provide additional protection to owners of patents in the United States. The general effect of the bill is to give the owner of the patent the same protection against the government of the United States, if one of its officials should infringe a patent, as he already has against an individual infringer. Numerous decisions of the Supreme Court have declared that the government has no right to appropriate patents without just compensation to the owners. In the case of Belknap vs. Schild, the Court said:

> "In this country letters-patent for inventions are not granted in the exercise of any prerogative or as a matter of favor, but under Article 1, Section 8 of the Constitution of the United States, which gives Congress power to promote the progress of science and useful arts, by securing for limited terms to authors and inventors the exclusive right to their respective writings and discoveries. The patent act provides that every patent shall contain a grant to the patentee, his heirs and assigns, for a certain term of years, of the exclusive right to make, use and vend the invention or discovery throughout the United States. This court has repeatedly and uniformly declared that the United States have no more right than any private person to use a patented invention without license of the patentee or making compensation to him."

It has long been recognized that some tribunal should be created by Congress, to which inventors could submit the question of infringement of their patents by the government, suing for consequent damages. The Court of Claims formerly had jurisdiction for this purpose, but only where there was a contract, expressed or implied, for the use of the patented invention. Unless there was such a contract between the patentee on the one hand and the government on the other, there was no tribunal to which the patentee could appeal for the protection of his interests. This defect in the law has, as above stated, long been recognized, and a remedy has been sought. As one of the Representatives in Congress declared in his argument in favor of the bill:

> "Every civilized government on the face of the earth, with the exception of Russia and the United States, has provided a tribunal where a patentee and his government may settle the question as to their respective rights, one against the other."

Since there was no way of collecting damages from the government for the use of a patent, under the old law, unless there was such a contract, which would give the Court of Claims jurisdiction, attempts have been made in the past to enjoin the goverment and its agents from using certain patented inventions. In the case of the International Postal Supply Co. vs. Bruce, a suit was brought against the postmaster at a certain place to restrain him from using an infringing machine in his post office, operated exclusively by his subordinates, employees of the United States, in the service of the United States. The Supreme Court, following the ruling in Belknap vs. Schild, held that the Circuit Court had no power to grant the injunction, since the suit was virtually against the United States.

Nobody denies the right of the government to appropriate a patent that may be useful for its own purposes, in times of peace or of war, but every honest man ought to deny the right of the government, after appropriating the patent, to refuse to the owner the fair compensation to which he is entitled. Article 5 of the Amendments to the Constitution provides: "Nor shall private property be taken for public use without just compensation." Notwithstanding this Article, there was no provision in the statutes which permitted a patentee to collect from the government the compensation due him for infringement of his rights. The government granted him a patent, giving him the exclusive right to make, use and sell the invention throughout the United States; and then frequently, during the term of the patent, it appropriated the invention for its own use, and the patentee was without a remedy, unless he could show an expressed or implied contract, with the United States or its officials, to pay him compensation for the use of the patented invention. Since the patent was his property, and the Constitution as above quoted provided that no private property could be so taken without payment, it seems strange that this intolerable condition was allowed to continue for years, with no determined effort to correct it. There are many inventions which are of no practical value to private citizens, and are available only to the government. Improvements in rams, torpedoes, ordinance, armor, come within this class. If the government of the United States can appropriate to its own use a patented invention without due compensation, it is obvious that this must tend to greatly restrict inventions of this class. If all pecuniary reward is withheld from inventors who patent devices which the government may find useful, the incentive to make them will be removed, and the government will be the loser. The bill as passed does not apply to any past acts of infringement, but only to cases of future infringement of patents. It gives the Court of Claims jurisdiction over any suit against the United States, where the invention described in and covered by a patent is used without license of the owner. In defending itself against a suit, the United States may avail itself of any and all defenses, general and special, which may be pleaded by defendants in an action. The government can show that there is want of invention, or that the patent is not valid, notwithstanding the fact that it originally issued the patent. This questioning of its own action would seem to create an anomalous situation, but Congress thought best to put the government in the same position, with respect to the patent suit, as any other infringer.

One provision of the law which is in the nature of an exception to the right of the patentee to sue for infringement, is when the patentee who makes his claim, or institutes his suit, is in the service of the government, or the assignee of any such patentee. The Act especially provides that it shall not apply to any device discovered or invented by such employee during the term of his employment or service. This is meant to prevent officials of the government from making inventions and applying for patents thereon, and then resigning from the service and instituting suits against the government. There have been not a few instances where men in the army and navy have made valuable discoveries as a result of the training and special opportunities for learning afforded by their work in those branches of the service. The discoveries were so valuable that the officials, after patenting them, were enabled to retire to private life; and they then brought suit against the government for infringement. There has been no provision in the statutes, up to this time, which excepted the invention of such an employee from the usual operations of the patent law: but hereafter there will be no incentive for a government employee to seek protection on an invention that he makes during the time of his service, provided the invention is of a class that would be of use to the government alone. If an officer of the navy discovers a new range finder or a new torpedo, he may obtain a patent on it, but the patent will be of no value to him, for the issuance of the same by the government will not give him any standing in the Court of Claims. Having discovered it during his term of service, he is precluded from claiming compensation from the government, if the latter decides to take possession of it. If he invents a rail joint or a non-refillable bottle, or any other device in which the government has no interest, he can patent it and enjoy its exclusive use. But if he happens to be a mail carrier or other postal agent, and he invents a new mail box or mail bag, or a device for delivering letters to railway trains in motion, the government may appropriate his invention and not be compelled to pay him any reward. It seems to us that this Act is in direct contravention of Article 5 of the Constitution, above quoted, with regard to private property not being taken for public use without just compensation; but we presume that the legal lights of the government have examined this phase of the question, and decided that there is no conflict.

While the Act restricts the rights of government employees in inventions in the lines described, it settles for all times, we hope, the right of the patentee to sue for compensation for infringement of any patent of which he may in future become the owner, provided of course he did not purchase the same from an inventor who made the invention while in government service. Improvements in ordinance, in postal devices, in coin testing apparatus, would in ninety-nine cases out of a hundred, be made by such employees, and since the Act provides only for future cases of infringement, it would seem to us that there would be few instances where this law would be invoked for the protection of patentees.

Looking at the matter from the standpoint of the government, it may seem only just that when an inventor makes a device during the course of his service, and such device is in the line of his work, it should belong to the government, for this is practically what the law means, although it does not so state. It does not in so many words give the United States control of the patent, but it tells the patentee, in effect, that if his torpedo, or mail bag, or such device, can be used by the government, he can collect no indemnity from the latter. Now if the government can do this, it is only a step farther to declare that an employer can appropriate the invention of his employee. It would be considered a most unjust law, if Congress should provide that any invention made by a workman, in the line of his occupation, during the term of his employment, should belong to his employer. The Supreme Court has ruled several times along exactly contrary lines. It has held that an employee is entitled to any invention which he may make during the course of his employment, unless he was expressly hired to make that invention. Yet Congress has passed a law which, while it does not make it impossible for a government employee to take out a patent on an invention, practically makes the latter of nugatory effect, since it debars him from suing

for compensation for the infringement.

The real object of the measure is to prevent abuses such as have occurred in the past. In one famous instance, a lieutenant in the navy, who had been educated at Annapolis at government expense, and had been paid for years to do government work, learned through practical experience the needs of the service in certain lines, and devised a range finder that was so useful that it was at once adopted. The officer then resigned, and sued the government for using the device. This instance is not isolated, but is typical of others. Another abuse was the fact that an employee in the government service not only had better facilities for inventing the special devices required, but better means for getting the government to adopt them. But in this case, as in many others, because a few are guilty, many innocent people must suffer.

During the debates in Congress, much was said about the necessity of protecting the interests of the inventor. We fail to see much of practical benefit that inventors as a class will gain from this law.

Continuous Typewriter.

Many efforts have been made to devise some means of doing away with the operation of shifting the carriage of the typewriter at the end of each line. In a machine recently patented, the letters, instead of being placed in a longitudinal line against a horizontal platen, follow one another around the circumference of a vertical platen. At the end of each line the only movement necessary is the raising of the platen the distance between the lines. In a sense, this new machine may be called the rotary continuous typewriter, while the others are reciprocating intermittent typewriters. A simple depression of a key raises the platen one, two or three notches to give the single, double or triple space, and the cylinder continues to rotate in the same direction, so that it is possible to write a whole page without removing the hands from the keyboard. To prevent the breaking of syllables at the end of lines, an automatic device moves the platen to start a new line when the space bar is touched near the end of a line.

Colored Moving Pictures.

Realizing that a properly colored moving picture film is far in advance of an uncolored one, a Frenchman has invented means by which the tinting can be done successfully. The coloring machines are ingenious affairs provided with a number of stencil strips as long as the picture films. Holes cut in the stencil strips correspond to the parts of each of the little pictures which are to receive the coloring of ink or dye each strip is expected to give the film. The stencil strips are run through the machine on top of the picture film, one at a time, until all the colors have been put on. The stencil strip and film strip, of course, run through the machine as if one solid layer. The coloring matter is put on the film by a short endless band of velvet which acts as an ink brush, the soft brush-like surface passing through the holes of the stencil strip and touching the surface of the film. After the machine colored films are retouched by hand, the result is so like the best natural color photography that the average observer cannot distinguish the difference.

Hunting a Cancer Cure.

The recent bequest of a million dollars, to be used in searching for a cure for cancer, will doubtless be productive of much good. Tuberculosis is regarded by many medical men today as far less of a menace to human life than cancer. The fight against this mysterious disease which kills so many people annually has been waged with vigor for years, but no treatment has been found that will positively check the growth of the malevolent tissue. Operations are successfully performed from time to time, some of them of an extensive nature and with remarkably successful results, but the real cure, or preventive, is yet to be discovered; and it is not to be expected until the actual character and the ultimate cause of the disease have been positively determined. The liberal gifts of funds by individuals, not only in the above mentioned instance but in others of less importance, in which the donors have themselves been victims of the pest, are promoting extensive research. In hundreds of laboratories scientists are searching for the origin of the disease, or for a specific, but thus far the results have been meager. The Rockafeller Institution is devoting a great deal of attention to the subject, but there is much yet to be learned. It is a lamentable fact that this curse of humanity is growing in frequency, especially in this country. On the other hand, it is not a fact, as generally believed, that cancers are never eradicated. One of the results of modern investigation is the discovery that cancers come and go and leave absolutely no trace behind them that is of value in studying the disease. These minor cancers are small, and their presence is discovered only through autopsies, but just how they were absorbed or sloughed off is so far unknown. Much is being learned, also, regarding the nature of cancer, and it may be that the work of the past decade has laid the foundation for the supreme discovery.

New Uses for Gyroscope.

The full sized gyroscope constructed by Louis Brennan, and the success of the experiments on the track laid for that purpose, have again attracted attention to this method of locomotion, the principles of which have already been described in these columns. Other adaptations of the gyroscope have been made with striking success. It has been tried in automobiles, to prevent skidding. This particular apparatus is fitted in a swinging frame attached to the car, and in spite of high speed and awkward turns negotiated over a thick coating of mud and soft soap, it was found to work perfectly. In the same way it is used to effect steady running, and to prevent the danger of overturning. The fly wheel familiar in nearly all gasoline motors is placed in a horizontal instead of a vertical plane. As is well known, the fundamental principle of the gyroscope is the resistance presented by the revolving disk to any change that tends toward removing it from its normal plane. Thus gyroscopic action causes a wheel to place its axis at right angles to the plane in which the axis is moving—a phenomenon which becomes easy of notice if one tries to move a revolving bicycle wheel from a horizontal to a vertical position while supporting it by the axle end. In the gyroscope automobile, the exercise of this action tends to maintain the body of the car (in which the fly wheel is suspended horizontally, and which thus becomes the normal plane of the gyroscope) always parallel to the ground over which the car is moving, so that the higher one side of the car is raised than the other when turning a corner, say, the more power is exerted by the gyroscope arrangement toward keeping it level and steady.

The same idea has been employed to prevent the rolling motion of ships in a seaway. In trials made off the British coast, the vessel was placed broadside on the waves (with the gyroscope fixed and braked) and was allowed to roll freely. When a considerable motion had been attained the gyroscope was released, and was permitted to oscillate longitudinally about a transverse horizontal axis, the bearings of which were attached to the hull of the vessel. The effect upon the rolling was remarkable. It was "damped" immediately, and after a few oscillations was practically extinguished, the deck remaining almost horizontal while the vessel moved up and down. Some of the nautical representatives present at the trials thought that if the rolling could be diminished in this manner and the deck kept nearly horizontal, there would be risk of the waves breaking on board to a greater extent than when the vessel was rolling; but observations showed that the contrary was true. The deck kept dry as the boat rose and fell with the gyroscope in action, and the conditions were much more comfortable than they were when the gyroscope was fixed and the vessel permitted to roll with the waves.

The agents of the steamship lines who witnessed the experiments were so impressed that it is anticipated that the system will be at once adopted in certain steamboats. The Hamburg-American Company is already constructing a gyroscope to be installed on an excursion boat that runs from Hamburg to Heligoland.

Another suggestion is that the gyroscope might provide a substitute for the mariner's compass. Once started spinning in a plane running north or south, it would never deviate until its rate fell below the necessary speed. It would not be affected by magnetic or electrical disturbances.

But it is not only for monorails, automobiles and boats at sea that the gyroscope finds application. An interesting speculation has been raised as to how it might be applied to steering airships in a fog, the ordinary compass being untrustworthy in aeroplanes or airships because their engines are worked on the magneto-ignition system, which deflects the needle hopelessly. Once the gyroscope is perfected as a compass it would be set spinning in the proper plane and the airship could make a straight course for its destination.

Scientific Rat Trap.

Rats, especially old ones, are very suspicious of unfamiliar objects, and it is this phase of rodent nature that makes them so difficult to trap. An examination of the rats caught by ordinary traps shows that they are generally the young and daring, and that the old ones have given the strange contrivance a wide berth. Consequently the first requirement of scientific rat catching is to make the rodents familiar with the trap that is afterwards to capture them, so that they will cease to fear it; and the second is to so arrange it that the uncaught rats will not be frightened away by the captives. Such a trap is described in a recent number of *Popular Mechanics*. It is made of wood and shaped like a bird house, having a cupola in which the bait is placed. At first the latter is so arranged that the rats can get the bait without being trapped. This assures them that all is well: but later the sides of the cupola are closed and to get the bait they must enter the main section of the trap through doors at either end. These doors are the result of an intimate study of rat nature, which showed that rats are fearful of entering a trap with only one exit, and that the sight of two doors reassures them wonderfully. For a couple of nights they are permitted to enter and eat the bait, then the trap is prepared for business. When the rat enters, his weight on the bait shelf closes and locks the door at both ends, but at the same time it opens a third exit. This is a pipe-like passage which ends in another room. The rat rushes through this exit, and on reaching its end is dropped through a false bottom into a barrel of water. The movement of the false bottom automatically opens the doors of the trap for the entrance of the next rat. The advantage is that the other rats in the vicinity see and hear nothing that alarms them. The only rats who learn that the box is dangerous are those who have passed through it, and they never return to tell the tale.

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Talking-machine sound-box..... .....P. J. Packman
Telegraphy, Receiving apparatus for wireless.....R. R. Goldthorp
Telephone-exchange system..S. B. Fowler
Telephone-support.....H. Blumenthal
Telephone system.....A. D. T. Libby
Telephone system, Automatic..A. H. Dyson
Threshing-machines, Separating-grate for.. .....F. F. Landis
Ticket, Railway.....W. S. Parker
Tire, Automobile.....H. S. Shafer
Tire for vehicles, Elastic..I. S. McGiehan
Tire-lifter.....J. W. Brown
Tire protector, Pneumatic..R. J. Morrison
Tire-remover.....P. C. Weist
Tire, Vehicle.....J. W. Carhart
Tire, Vehicle.....J. A. Wright
Tire, Vehicle-wheel.....F. Wiechard
Tire, Wheel.....B. Dahl
Tobacco-pipe.....A. N. Malcomb
Tool-driving machanism.....H. W. Jacobs
Tool, Combination.....P. A. Peterson
Tool-retainer for air, eleetric, or mechanically-driven implements...M. G. Hilpert
Toy.....J. T. Stafford
Toy.....F. H. Callahan
Toy or picture book.....G. Tuck
Track-sander.....W. A. Pitt
Traction mechanism, Vehiele..... .....J. L. Williams
Train-signaling and brake-releasing mechanism.....H. H. Hunt
Transom-holder.....W. Cox et al
Transplanter.....A. C. Rumble

Trap-rest.....J. W. Walter
Tray-raiser.....O. B. Adams
Tread, Safety.....J. T. Simpson
Trigger-controller.....R. A. Moore
Trolley-pole.....C. E. Bradford
Trolley-wire-suspension means.....S. S. Berkley
Trousers, Adjustable.....A. P. Melen
Trowel.....J. G. Thatford
Truck, Tongue.....C. A. Foell
Tube-cleaning tool.....C. F. Overly
Tube-joint.....J. Kenny
Tufting-machine.....W. E. Buser
Tufting-machines, Button-support for.....W. E. Buser
Tug, Hame.....A. L. Saddlemire
Turbine, Combustion....S. Z. de Ferranti
Turbines, turbo-pumps, &c., Manufacture of strip material suitable for the blades of.....S. Z. de Ferranti
Type-casting machine.....O. V. Sigurdsson
Type, Priuting.....H. J. Smith
Type-setting apparatus.....L. K. Johnson
Type-writing machine.....W. E. Barnard
Type-writing machine.....W. J. Barron
Type-writing machine.....F. A. Young
Type-writing-machine paper-finger.....C. Gabrielson
Type-writing-machine ribbon-feeding mechanism.....F. Alexander
Type-writing-machine ribbon-reversing mechanism, Automatic..G. M. Kitzmiller
Type-writing-machine tabulating device...F. Alexander
Umbrella.....A. Peck
Umbrella, Folding.....J. Peterson et al
Umbrella-holder lock...C. F. Wilson et al
Umbrella-runner.....G. F. Hall
Urao, Refining.....N. Wrinkle et al
Vacuum-cleaner.....C. B. Foster et al
Valve.....S. E. McKnight
Valve and the like, Stop.....J. Fletcher
Valve, Doubly-actuated expansion.....G. P. Carroll
Valve, Electric.....F. N. Roehrich
Valve, Electric.....L. M. Schmidt
Valve, Engine.....A. J. Anderson et al
Valve, Engineer's..3 pats....W. A. Pendry
Valve for charge-forming devices, Auxiliary air.....J. H. Friedenwald
Valve-operating mechanism....J. T. Knott
Valve, Retaining.....F. H. Woods
Valve-seat grinder.....E. E. Townsend
Valve, Triple..2 pats.....W. A. Pendry
Vehicle electric driving mechanism.....A. Aichele
Vehicle hood, Motor.....W. P. Mays
Vehicle, Motor.....E. Gerber
Vehicle-spring.....H. W. Smith
Vehicle-spring.....A. M. Kindwall
Vehicle suspension, Road.....F. Walton
Vehicle-wheel..3 pats.....A. Brisbane
Velocipede.....E. V. Turner
Vending-machine.....P. S. Bloch
Vending-machine.....H. S. Pond
Vending-machine, Card.....R. F. Downey
Vise, Miter-clamp.....H. B. Depworth
Voting-machine.....G. Johnson
Voting-machine.....J. McTammany
Wagon-body.....F. F. Groff
Wagon, Dump.....W. S. Coates
Wagon-rack, Adjustable.....J. W. Brown
Wagon-reach adjuster.....W. P. Dunlap
Wagon, Tank.....W. and A. M. Graver
Wall-tie.....L. H. Selden
Warp drying-machine, Sized...G. Masurel
Washing-machine.....J. F. and W. P. Burkholder
Watch-stem movement..G. W. Grisdale, Jr.
Water-heater.....T. A. Steller
Water-heater, Automatic.....A. E. Miller
Water-motor.....H. T. Farnsworth
Wave-receiving device.....F. G. Sargent
Wedge, Handle-fastening.....T. Hooker
Weeder.....H. H. Qua
Weighing-machine, Automatic.....H. Richardson
Wheel-cutting machine.....M. Pedersen
Wheel rim, Vehicle.....W. E. Greer
Whip-label guard.....N. F. Alston
Whip-socket lock.....G. Gabel
Willow-stripping machine.....G. S. and C. J. Herrick
Window.....I. A. Boyd
Window-screen.....H. Higgin
Wire-drawing machine and uncoiling appliance therefor.....J. A. Horton
Wire-fastener.....J. Life
Wire-stretcher.....B. B. Bobb
Wire-twisting machine.....J. F. Foley
Wood-bending machine.....J. B. Cameron
Wood, Extracting products from..F. Pope
Wood, Preserving.....J. Gerlache
Woodworking-machine.....A. B. Norris
Wrecking apparatus.....J. M. W. Hassing et al
Wrench.....F. Hachmann

DESIGNS.

Badge or similar article.....J. J. Dideoet
Casket handle-plate.....F. K. Allen
Goblet or similar article....J. H. Vernon
Lamp-shade.....H. McAfee
Plate or similar article....J. H. Vernon
Rug.....A. Petzold
Shade-reflector or similar article.....O. A. Mygatt
Type, Font of.....W. A. Schraubstadter
Wheel, Hand.....W. Nelson

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MECHANICAL PATENTS.

Abdominal adjuster, reducer, supporter and retainer.....A. Harris
Abrading-machine.....F. C. Rowell et al
Account-keeping apparatus, Manifolding...C. F. Hudnall
Acetylene-burner.....F. M. Casto
Acetylene generator and torch, Portable...A. F. Jenkins
Acid, Apparatus for concentrating sulfuric.....O. Proelss et al
Acid, Making formic.....H. Howard
Acid, Manufacturing carbonic.....E. A. Behrens
Adding and recording machine.....G. W. Dudley
Adding machine, Perpendicular and horizontal.....C. E. W. Gardner
Adding-machines, Power-drive for.....O. C. Kreis, Jr
Adjustable bracket.....T. Smith
Advertising device.....G. W. Hanlon
Advertising device.....J. Adrian
Air-brake angle-cock connection and support.....M. A. Garrett
Air-brake system, Electropneumatic.....G. Macloskie
Air-brake systems, Angle-cock support for.....M. A. Garrett
Air compressing and pumping apparatus, Compound liquid-piston....J. K. Sweeny
Air-compressor.....D. R. Allard
Air-conditioning apparatus.....S. W. Cramer et al
Airship.....R. E. Green
Aluminous material, Purifying.....L. E. Saunders
Anchor-socket.....I. Cowles
Annealing-furnace.....J. D. Swindell
Annunciator and indicator, Pneumatic....C. B. Withrow
Annunciator, Elevator.....W. W. Savage
Anthraquinone acridones.....F. Ullmann
Anthraquinone-di-acridones....F. Ullmann
Ash-shovel.....R. Brownson
Automatic alarm and gas-pressure cut-off device.....O. C. Moon
Automatic lubricator.....W. Pfeifer
Automatic ventilator.....C. E. Reitz
Automobile-brake.....J. J. Stawartz
Automobile-headlight controller.....E. A. Adams
Automobile steering-wheel...E. K. Hardy
Awning-fixture.....W. J. O. Astrup
Axle, Car.....S. T. Pyeatt
Backing-strip-applying machine.....W. L. Jacobie
Bag-holder.....E. C. Vicary
Bag-tie.....J. M. Stryker
Baler, Hay.....W. T. Bishop
Barber-shops, Registering-indicator for....S. H. Mason
Barovacuummeter.....G. Frerichs
Barrel-cover.....A. M. Weaver et al
Basket.....J. Johnson
Basket, Delivery.....W. S. Crum
Beam, Floor and ceiling..J. W. Vaughan
Bearing for trolley-wheels, Self-lubricating.....A. M. Levering
Bearing, Truck.....A. Franz
Bed, Hospital.....E. M. Heaton
Bed pillar or post.....J. C. Wilson
Bed, Tourist's.....G. G. De Moss
Bed, Wall.....W. S. Jensen
Bedstead.....A. and R. Berg
Belt-tightener.....A. F. Kuvis
Belt-tightener.....H. A. Perkins
Bench-hook.....H. R. Mitchell
Bench-tool, Adjustable.....F. O. Schalkle
Beverages, Preparation of.....G. Defren
Bicycles, Mounting of saddles upon.....W. J. Welch
Billiard-cue powderer.....H. Nahm
Binder, Loose-leaf.....A. L. Murphy, Sr.
Binder, One-piece loose-leaf.....A. W. Badrow
Binder, Temporary.....R. R. Darwin
Bituminous mixing machine....J. H. Ryan
Blotting device.....H. Uehlinger
Blowing-engine.....P. H. Kane
Boat, Life.....J. E. Allen
Boat, Submarine.....L. E. Goetz
Boiler gage, Steam.....W. T. Piper
Bolt.....R. B. Ingels
Bolt-holder.....M. V. Gist
Bolting-machine.....O. and C. H. Evans
Book cover, Manifolding-sales.....F. H. Spencer
Book, Loose-leaf..2 pats.....A. L. Murphy, Sr.
Book, Self-indexing.....J. B. Perrine
Books and the like, Making scrap.....T. E. Layton
Boring or drilling bit.....W. Geddes
Bottle and attachment therefor.....C. A. Hervey
Bottle-capping machine.....L. C. Krummell et al
Bottle-dam.....W. S. Gray
Bottle-lip-protecting device, Sanitary.....W. B. Degan
Bottle-lip protector, Sanitary..W. B. Degan
Bottle, Non-refillable.....C. Schickerling
Bottom-finishing machine.....C. Pease
Bowling-alley.....A. B. Wetherell
Box-bit, Adjustable.....F. A. Hanes et al
Box-making machine.....E. W. Labomarde
Box-strap puller, cutter and nail-gnide...W. M. Brooks
Brake.....W. J. Smith
Brake-beam.....C. F. Huntoon
Brake-head, Adjustable....F. R. Cornwall
Bread-mixer.....G. Friedman
Bridle eye-cover or blinker.....M. Konnel
Brush.....P. Maendler
Brush.....G. D. Pushee
Brush-handle, Adjustable....C. W. Mabey
Brush-holder.....A. Freier
Brush, Rotary.....J. W. Adler
Buckle.....W. A. Holden
Buckle.....J. E. Smith
Buggy-boot.....J. E. Carroll
Buggy-top clip.....J. C. and J. M. Horn
Building-blocks.....G. A. Kahl
Buildings, Lining or back plaster for.....C. D. Jennings
Burner and support for vaporizers.....C. A. Butler
Button, Rotary locking collar.....G. Ponarouse
Button, Saparable.....W. L. Bate
By-products, Means for recovering.....P. M. Hamlin
Cabinet for theatrical use, Make-up.....A. E. Spinner
Cabinet locking device, Sectional.....A. T. Weiss
Cabinet-table.....W. A. Snyder
Cable-carrier apparatus.....G. A. Amsden
Cable support, Aerial..W. K. Krips et al
Calculating-machine.....D. E. Felt
Camera flash-light attachment..S. Roesner
Can-top.....J. R. Harbeck
Cap, Giant-powder.....J. H. Fahy
Car construction.....J. R. Cardwell
Car-coupling.....A. P. Goldmau
Car-coupling.....G. A. Holland et al
Car draft-gear, Railway.....G. Barr
Car, Dumping.....U. W. Keech
Car-platform closure.....I. H. Saunders
Car, Rack-rail-braking.....N. D. Levin
Car safety-gate, Railway.....F. T. Fillion
Car-step, Extension.....J. J. Oling
Car wheel, Mine.....T. Donohoe
Carbon-breaker.....H. B. Basim
Carbureter.....A. C. Stewart
Carbureter.....L. Plein
Carrier.....S. C. Gardner et al
Carving figures in relief and intaglio, Machine for.....H. M. Albee
Cash-register.....J. H. McCormick
Cash-register.....G. H. Wolff
Casting metal, Manufacture of molds for..E. L. Bohl et al
Cement block.....E. C. Lanning
Cement-block-making machine, Hydraulic..W. L. Keny
Chain-cloth, Machine for making.....F. Bement
Chair back, Automatic reclining.....F. B. Wersel, Jr.
Chalice.....C. J. Ljunggren
Checking device.....C. G. Harris
Cheese-cutting device.....C. Segale
Chuck, Bit-brace.....H. P. Richards
Chuck, Reinforced lathe...H. M. Reynolds
Churn.....E. L. King
Churn.....J. D. Tucker
Churn, Automatic.....J. N. Nall
Cigar-maker's rolling-board..J. Kletti, III
Circuit-breaker, Automatic..H. W. Leonard
Clamp.....P. Bondreau
Clothes-line raising and lowering device..J. W. Fields
Clothes-pin.....G. E. Devore
Clutch.....J. A. Dickey
Clutch mechanism....F. E. Snddoth et al
Coaster-brake.....P. W. Toohey
Coating perforated webs, Method and apparatus for.....F. B. Thompson
Cock for water-closet cisterns, Ball.....T. Bonroe
Cock, Stop and waste.....T. B. Hensey
Coffee or tea pot.....W. C. Leimbach, Jr., et al
Coin-detector.....F. Schorik
Collar.....H. Y. Scott
Collar-supporter.....C. C. Morris
Colors and making same, Blue sulfid.....R. Herz et al
Colors, Fixing sulfid.....L. Lichtenstein
Colter, Plow.....J. R. Davis
Commutator-motor, Alternate-current.....V. A. Flynn
Commutator-motor, Polyphase..2 pats.....W. A. Flynn
Compensator.....E. Thomson
Composition of matter..W. G. F. Siegmann
Concrete and like walls in the earth, Constructing.....G. W. Jackson
Concrete construction.....F. B. Gilbreth
Concrete forms, Support for.....C. M. Markham
Concrete-mold.....W. T. Harris, Sr.
Concrete steps, Protector-plate for edges of.....J. G. Braun
Concrete structures, Reinforcement for....R. E. Newton
Concrete tower, Reinforced.....L. F. H. de Miffonis
Condenser.....W. Schwanhausser
Cooling apparatus.....W. B. Allbright
Corer and slicer, Apple.....A. W. Rand
Cores of sand, Making.....G. W. Lewis
Corner-bracket for show cases, Swinging..L. A. Becket
Cotton-packer.....A. S. Dixon
Crate.....E. F. Ribbeck
Crate.....W. Beehler
Cream-separator, Centrifugal.....G. M. Anderson
Crutch-tip.....P. W. Pratt
Cultivator attachment.....O. E. Adamson
Cultivator-plow attachment...J. A. Sutton
Culvert-pipe.....R. C. McWane
Current-motor, Alternating...W. A. Flynn
Current-reinforcing means...R. C. Browne
Current-translating device, Alternating....L. F. Howard
Curtain-bracket.....S. Bettigole
Cutting apparatus.....G. W. Flora
Cycle hub with brake mechanism, Free-wheel.....E. Saehs
Cylinder-cooling means.....G. D. Warren
Dams, &c., Raking mechanism for.....O. Wunder
Daruing, Stocking-holder for use in.....A. F. Collins
Derrick, Portable.....R. B. Woodworth
Desk, Folding.....L. Daniels
Desk, Retouching.....H. Weimer
Desk, School.....F. E. Ramsden
Dewatering device.....W. A. Hendryx
Disinfectant-distributer.....J. H. Melville
Disinfecting and deordorizing apparatus...E. Rooch
Display and stock cabinet, Hat.....C. J. Kleckner
Display-cabinet.....C. F. Krom
Display-rack for show-cases.....J. H. Servatius et al
Distributing device.....W. G. Taylor
Door-check.....W. K. Henry
Door-fastener.....J. Early
Door-fastener.....C. C. Kusterer
Door-fastener, screen.....R. E. Turner
Door-hanger.....C. Lakosky
Door-lock.....H. J. Amick
Draft-equalizer.....A. B. Olsen
Draft-rigging.....W. P. Bettendorf
Drag and grader, Road.....O. F. Phillips et al
Drilling-machine front head.....G. Kommerling
Drinking-cup.....M. M. Billings
Dust-collector.....D. J. T. Oldham
Dye and making same, Brown sulfur.....G. List
Dye-vat-charging apparatus.....B. Mayoux et al
Dynamite-heater.....O. Molander
Dynamos, Suspension for train-lighting.....J. A. Misland
Eaves-trough protector.....H. R. Daniels
Electric accumulator.....L. Marseille et al
Electric cable, Aerial..C. E. Egner et al
Electric-conductor hanger.....J. P. Conway et al
Electric-conduit fitting.....J. C. Vogel
Electric currents, System for the generation and distribution of..R. M. Newbold
Electric furnace.....T. F. Baily
Electric furnace.....J. W. Evans
Electric heater.....J. C. Royce
Electric machine, Dynamo.....J. E. Noeggerath
Electric machine, Dynamo.....L. E. Underwood
Electric switch.....E. M. Hewlett
Electrical-separation apparatus.....H. A. Wentworth
Electrically-operated lock....H. S. Balliet
Electrode for welding.....W. A. Neff
Elevating machinery.....A. T. Prescott
Engine.....W. E. Blair
Engine-controlling device...R. V. Longtine
Engine cylinder, Gas.....F. E. Norton
Engine igniting system, Explosive.....F. W. Springer
Engine spark-plug, Explosive..J. P. White
Engine starter, Hydrocarbon...C. Brisbois
Engine-starting device, Explosion.....E. N. Pagelsen
Engines, Means for facilitating the starting of internal-combustion.....F. Purdy
Envelop.....F. L. Norman
Eyeglass-mounting..2 pats..C. A. Hoffman
Fan, Automatic rocking-chair.....A. Lawson et al
Fans, Cut-off for.....T. O. Carlisle
Fare-box.....G. B. Kohler
Fare-register rods, Removable handle for.....W. F. Frenzel
Fare-slip holder, Cash.....H. E. Thomsen
Fastener, Detachable.....W. C. Schmidt
Faucet.....J. A. Petro
Faucet.....W. E. Portero et al
Faucet, Dispensing.....E. E. Murphy
Faucet, Two-way.....E. E. Koken
Faucets, Price-computing attachment for measuring.....C. Jones
Feed heating and superheating boiler.....S. A. Reeve
Feed-trough.....B. F. Miller
Feed-water-heating appliance..C. J. Mellin
Feed-water purifier, Boiler.....I. Adler
Feeding-bag, Nose.....J. N. Beenken
Fence-post.....A. W. Sprague
Fender.....A. Littman et al
File or binder, Newspaper.....C. E. Wattersou
Film-winder.....E. A. Bircher
Filter.....H. Brunner
Fire-box door with draft device.....J. A. Sandy
Fire-escape.....H. L. Cooper
Fire-hose guide-rack.....S. B. Willis
Fire-hydrants, Discharge-uozzle and independent cut-off valve for....A. L. Bixel
Firearm, Automatic.....R. Frommer
Firearm, Repeatiug.....T. C. Johnson
Firearm-sight.....C. Tyler
Firearms, Telescope-sight mount for.....F. F. Burtou
Floor-scraper.....A. T. Beeler
Floor-wiper.....G. Friedman
Fluid-expansion press.....L. C. Turley
Fluids, Rate-indicating device for.....F. N. Connet
Flusher for water-closets, &c..W. Turnbull
Fly-catcher.....H. von Essen
Fly-wheel.....E. C. Critchlow
Flying-machine.....L. L. Crane
Folding bench.....E. W. Heiser
Folding chair.....F. Martinson
Footwear.....M. M. West
Form, Garment.....E. T. Palmenberg
Fruit-picking bag.....F. W. Burch
Fuel-briquets, Manufacture of.....W. F. Collins
Furnace.....J. Weintz
Furnace.....H. N. Leask
Game apparatus.....W. H. Darrow
Game apparatus.....G. Huckstra
Garbage-furnace, Domestic....A. V. Wood
Garment.....E. J. Quigley
Gas apparatus, Water.....F. B. Dougherty
Gas burner, Hydrocarbon....L. F. Millard
Gas-burner, Inverted.....E. Steil
Gas-burners, Shade-holder for inverted.....S. F. Elkins
Gas-engine.....A. Burnett
Gas-engine.....D. W. Lyon
Gas-engine.....W. G. Abbott, Jr.
Gas-engine.....C. G. Sprado
Gas-generator.....W. A. Wallace
Gas-heater.....A. Rector
Gases, Indicating and measuring device for use in mines or wherever desired to detect the presence of combustible.....H. H. Clark
Gate.....W. A. Law
Gearing.....P. Hadnagy
Gearing.....C. P. Johnson
Gearing, Transmission..C. A. McKiearnan
Glass-gathering machine.....R. D. Brown
Glassware, Fire-polishing....A. J. Sanford
Glove-reversing device.....A. F. Imbric
Glue, Converting.....C. M. Zimmerman
Governor.....N. Lombard
Governor, Emergency.....F. Samuelson
Grab-hook.....C. W. Ebert
Grain-treating apparatus.....E. B. Cox

Grader and ditcher, Road.....J. P. Evans et al
Graining-tool.....F. M. Clapp
Grinding device.....A. M. McLeran
Grinding-machine.....P. J. Poitras et al
Gun, Automatic.....G. Colleoni
Gun-stock.....G. A. Stevens
Gyratory crusher.....G. F. De Wein
Hair-comb.....J. H. Aker
Hame attachment.....A. M. Capron
Hame-fastener.....R. D. Simpson
Hammer, Power.....A. Beaudry
Hammer, Steam.....F. G. Gasche
Hammocks and other structures, Seating for couch.....I. E. Palmer
Harvester.....O. L. Perrigo
Harvester.....A. R. Blewett
Hat-hanger.....G. Smith, Jr.
Hat sweat-band.....J. R. Beenken
Hay-loader.....S. K. Dennis
Hay-press.....G. F. Woodward
Hay-turning machine of the drum type.....L. Keeser
Headlight-burner.....C. E. Powers
Heating-furnace.....F. J. Droege
Heel, Shoe.....H. J. P. Rottger
Hinge for self-closing gates.....J. Buellesbach
Hoisting mechanism.....J. Farrell
Hoop-setting machine.....G. R. Merriman et al
Horn.....J. Burke
Horse-bonnet.....J. M. Davies
Horse-rake.....J. T. Bell
Horseshoe.....B. Wilbur
Horseshoe-making machine.....W. Peacock
Hydraulic motor.....G. B. French
Hydrocarbon-burner.....L. A. Sherman
Ice-cream freezer.....B. Kuhl
Igniting-furnace for pulverous fuel.....N. K. H. Ekelund
Illuminating-body.....G. Weissmann
Incandescent mantle, Inverted.....C. K. Harding
Incubator.....G. W. R. Zimmerman
Indicator.....J. F. Marousek
Indoxyl, &c., Making.....M. Mudgan et al
Inhaler.....H. Eddo
Ink-well.....W. J. Somerville
Inkstand.....F. M. Ashley
Inseam-trimming machine.....A. Bates
Inseam-trimming machine.....W. B. Keighley
Insecticide.....I. W. Drummond
Insulation-joint.....A. McLean
Internal-combustion engine..C. A. Bennett
Internal-combustion engine...J. E. Gilson
Ironing-table.....J. A. Beach
Jewels or ornaments to studs, Means for securing.....E. E. Kahn
Joint construction.....D. E. Hunter
Joint-fastening.....C. H. Kimball
Journal-bearings, Lining.....F. H. Howard
Key lock, Interchangeable...A. W. Sibley
Kiln.....W. Drayton
Kinetoscope.....G. W. Bingham
Kinetoscope-shutter.....G. W. Bingham
Knitting-machines, Fabric-cutting device for.....F. B. Wildman
Ladder-bracket, Adjustable...F. T. Peters
Lamp.....W. French
Lamp circuits, Electric switch for incandescent.....W. B. Crossland
Lamp, Electric-arc..H. W. Headland et al
Lamp mantles, Attachment for incandescent.....R. M. Dixon
Lamp, Metallic-filament electric glow.....H. Kuzel
Lamp receptacle, Incandescent.....H. F. Badeau
Lamp socket, Street.....C. L. Bundy et al
Lamp, Safety.....H. Feldmann
Lamp-socket, Twin.....H. R. Sargent
Lamp support, Electric...S. W. Bailhache
Lamp support, Electric.....J. Neple
Lamp, Vapor.....H. C. Wright
Lamps, Shock-absorbing and cord-adjusting device for incandescent electric.....C. A. Burnham
Lantern, Projection.....C. F. Dutton, Jr.
Last, Locking hinged.....A. E. Peckham
Latch, Door.....A. Neuenschwander
Latch, Gate.....J. B. Barnwell
Latch, Gate.....H. R. Elliott
Lathe-center.....W. J. McIntyre
Lathing.....A. P. White
Lead joint-runner.....W. Vanderman
Leather pieces edgewise and otherwise operating upon the edges of material in sheet form, Machine for joining.....L. G. Weston
Level attachment for drills....F. Schtabe
Leveler, marker and border machine, Combined.....J. P. Wallace
Light-securing means.....T. Hoops, Jr.
Lighting-fixture hanger...E. H. Wakefield
Link, Spring.....H. W. Sanford
Liquids, Air-controlled feed system for.....E. J. Moore
Liquids, Purification of.....A. E. Williams
Loading device.....F. Fifield
Lock.....M. H. Farmer
Locking-bolt.....C. W. Obert
Locomotive-ash-pan-dumping device.....W. J. Brown
Locomotive-cab window.....J. W. Estes
Loom.....A. J. Chevrette
Loom embroidery attachment, Weaving.....L. Veyron
Loom shuttle-race.....E. Stutz
Loom, Tufted-fabric.....J. A. Clark
Looms, Weft-replenishing apparatus for weaving.....L. Langenieux
Lubricating device.....T. G. Kincaid
Lubricator.....P. J. Sweeney
Machine-tools, Feed mechanism for spindles for.....H. O. Evans
Magnet controller, Lifting.....J. F. Motz
Magnetic separator.....W. B. Moore
Mail-box.....P. Reynolds
Manure-loader.....M. W. Brennan
Mask, Face-protecting.....M. Dysthe
Massage apparatus.....L. A. and C. M. Seibert, Jr.
Massage devices, Cup or head for.....C. M. Seibert, Jr.
Match-box holder and cigar-cutter, Combined.....E. Oldenbusch
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Dust-pan.....A. Armstrong
Dye, Azo..2 pats.....O. Guuther et al
Dye, Blue..2 pats.....O. Gunther et al
Dye, Gallocyanin.....W. Lommel
Dye, Green azo.....J. Jansen et al
Dye, New vat.....P. Thomaschewski
Dye, Red azo.....J. Jansen et al
Dye, Vat.....P. Thomaschewski
Dye, Vat.....W. Bauer et al
Dyeing acetyl cellulose....E. Knoevenagel
Dyeing and product thereof.....R. Ott
Dyestuff, Vat.....W. Bauer et al
Egg-beater.....J. N. Ward
Electric cut-out.....T. E. Murray
Electric-switch.....L. Larsen
Electric switch.....H. C. Grant
Electric switch, Time-controlled.....F. M. Tottingham
Electric transportatiou, Aerial..O. J. Davy
Electrical conductor.....C. A. Keller
Electrical-distribution system.....G. E. Palmer
Electrode, Arc-lamp..2 pats.....G. A. Thomson
Electrolytic apparatus.....H. Hatfield
Electrolytic apparatus with anuular anode.....H. Hatfield
Elevator-brake.....F. A. J. Schultz
Elevator safety devices, Meaus for operating.....G. B. Rice
Emery-wheel dresser.....W. D. Rearwin
Engines, Ignition magneto mechanism for air-started iuternal combustion.....C. E. Sargent
Erasing-material holder...G. P. Kingsbury
Examining matter or objects iu quantities, Apparatus for.....J. I. Solomon
Explosive-engine.....E. S. Bowen
Fan, Oscillating.....E. C. Lipps
Fat in milk and other dairy products, Process for the determination of.....O. Wendler
Faucet, Automatic.....W. A. Schmeykal
Faucet, Combination.....A. Beyer
Faucet, Sanitary automatic.....A. J. Ketelsen
Feed-controlling mechanism.....A. L. De Leeuw et al
Feed-cutters, Conveyer for....M. Freeman
Feed-table gage.....W. F. Minnick
Feed-water regulator.....C. O. Bergmark
Fence machine, Wire.....W. M. and C. E. Birch
Fence-post and wire-stretcher, Combined..W. J. Davis
Film-reeling mechanism....A. C. Roebuck
Filter for clarifying gelatin liquors and the like, Bone-black.....J. H. Utley
Filtration.....E. Burt
Fire-alarm box.....T. Haines
Fire-escape.....H. Johnson
Fire-escape.....A. O. Miller
Firearm, Take-down.....W. Bennett
Firearms, Foldiug stock for..W. L. Marble
Fireproof window-frame....C. A. McGinnis
Fish-hook.....P. Reither
Flat-iron-handle cooler..H. W. Sidegreaves
Float tide-mill.....U. S. Jackson
Floor construction.....J. Kahn
Flue-eleaning device....N. E. Bartles et al
Fluid-jet motor.....C. C. Cliue
Flush-reeeptacle plate, Self-closing.....H. Hubbell
Flushing-tank.....F. J. Morgan
Foot, Artificial.....J. H. Bradley et al
Foot-rest chair.....A. K. Christiansen
Formaldehyde, Apparatus for preparation of.....E. Huwart
Fuel, Apparatus for burning powdered.....H. R. Barnhurst
Fuel, Artificial.....P. Grayson
Fuel, Burning powdered...H. R. Barnhurst
Furnace-grate.....H. A. Poppenhusen
Furnace-regulator.....A. L. Goodenow
Fuse, Electric.....A. J. Smith
Game device.....H. M. Chase
Garment-clasp.....J. Lemay
Garment-supporter.....E. N. Humphrey
Gas-engine, Two-cycle.....O. H. Dorer
Gas-lighting device, Time-controlled.....H. W. Gates
Gas-supply system.....H. D. Donnell
Gate.....E. Stebbings
Gate.....I. N. Graham et al
Gear, Reversing.....V. E. Randall
Gearing.....J. R. Trigwell
Gearing.....V. A. White
Gin-saw cleaner.....G. P. Roberts
Glazing-bar.....C. A. McGinnis
Glue-couverter.....C. M. Zimmerman
Glue-melting apparatus..C. M. Zimmerman
Go-cart.....R. C. Robinson
Governing mechanism for explosive-engines.....P. Paulson
Grass-cutting machine....F. B. Dale et al
Grinder, Cutlery.....H. E. Sweet
Grinding and surfacing.....H. B. Nichols
Grinding apparatus.....S. T. Moore
Gripping, pasting, and folding mechanism.....G. W. Swift
Gun, Tubular-magazine.....T. C. Johnson
Gymnastic apparatus.....P. B. Kelly
Hair curler and waver.....J. F. Martin
Hair-drier.....F. N. Hunnewell
Hair-roll with comb-band attachment.....E. A. Stacy
Hammer, Power-operated....R. F. Arnott
Hammock-support.....L. I. Berkowitz
Harness and heddle-frames, Hook attachment for.....L. Robidoux
Harrow, Disk.....R. Ewing
Harvester, Corn.....J. Little
Harvester, Corn.....T. O. Thurston
Hat-tree.....H. D. Lloyd
Hay-press.....C. D. Clark
Head-rod, Adjustable.....H. F. Roach
Headwear and clothiug holder..J. Maitland
Heater.....R. C. Frampton
Heating-system, Automatically-regulated..D. J. Powers
Heatiug systems, Pipe connection for fluid.....E. J. Deegan
Heel, Boot or shoe.....C. E. Macduffee
Hoisting device.....W. A. Dunmire
Horse-checking device.....O. D. Shank
Horseshoe.....H. Johansen
Hose-coupling, Swivel.....J. Shotwell
Hose holder, Gardeu.....J. Jaeger
Hose-nozzle support.....C. V. Hoover
Hose-supporter.....P. R. Duchemin
Hose-supporter.....M. Finkelstein
Hose-supporter belt.....D. Kops
Hydrosulfite compound and making same..A. Weindel
Incubator-heater.....W. A. McMahon
Incubators, Thermostatic regulator for....H. M. Sheer
India-rubber or caoutchouc and extraction of caoutchouc from raw materials contaiuiug caoutchouc, Regenerating and devulcanizing.....G. Austerwell
Indicating instruments, Register mechanism for.....F. F. Kinney
Insulator.....W. L. Reusch
Internal-combustion engine..W. W. Morse
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Invalid-chair.....C. F. Walker
Iron ores, Cleaning.....E. F. Goltra
Ironing-machine.....W. French
Irouing-table.....V. O. Crawford
Joint lock, Swing.....B. W. Stouffer
Keyhole-lock.....G. S. Nickum
Kiln.....M. F. Swauson
Labels and the like to cans and other articles, Machine for applying..B. W. Tucker
Lacing boots, Device for....M. Bredenberg
Ladder, Step.....A. J. Ketelsen
Lamp, Arc.....J. C. Piper
Lamp base, Incandescent...T. G. Turner
Lamp-hurner attachment.....H. C. Lyng
Lamp globe or shade, Gas.....T. J. Little, Jr.
Lamp socket, Electric....G. W. Goodridge
Lamps and analogous structures, Locking mechanism for.....R. H. Welles
Lamps, Gas-lighter for automohile.....H. V. Cole
Lamps of cycles, automobiles, &c., Pyrophoric iguiting device for....C. F. Droll
Latch, Gate.....H. R. Elliott
Latch, Sliding-door.....D. A. Anderson
Lathe, Copying.....E. Bostock
Lathe-dog.....J. M. Palmer
Lathe-head-clamp.....A. Wood
Lavatories, Manufacture of earthenware..R. E. Crane
Lawn-sprinkler.....F. E. Opitz
Leather-skiving machiue.....J. R. Scott
Leuco derivative of diethylgallocyauin....W. Lommel
Life-preserving swimmiug-jacket.....A. Badger
Life-raft.....W. S. Ray
Light-projecting device.....C. R. Forster
Limb suspeuder and back-check, Artificial.....J. F. Rowley
Liquor-treating apparatus.....J. Seitz
Litter-carrier.....C. F. Brostrom et al
Litter-carriers, Single-lever lock and trip mechanism for.....W. Gutenkunst
Lock-washer.....C. F. Beers
Loom, Weft-replenishing....F. E. Ashton
Looms, Thread-cutting temple for weft-replenishing.....A. A. Gordon, Jr.
Machine-tools, Indicating device for.....C. D. Audrew
Machinery-brake.....H. G. Brown
Magnet controller, Lifting.....A. C. Eastwood
Mail-bag-fork attachmeut.....J. A. Falvey
Mail-box.....S. C. Cox
Mail-receptacle, House.....S. D. Pierce
Manure-distributer.....R. R. Lokey
Massage-apparatus handle.....T. A. McCall et al
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Mattress, seat, and the like, Air.....N. C. Hinsdale
Measure, Liquid.....S. N. Krawchenko
Measurer.....J. B. Martin et al
Measuring and filling machine.....R. J. Workman
Meat-tenderer.....O. Summerfield
Mechanic's furnace.....P. R. Flamm
Medicated tampons.....J. C. Dorr
Metal sheets, Treating.....A. Ridd
Metals, Heating and melting..W. N. Best
Meter-panel.....H. Krantz

Metallic characters to leather and the like, Attaching.....N. M. Stanley
Metering panel-board.....H. A. Robinson
Milk-cooler.....A. L. Wastel
Milking device.....D. E. Howatt
Mitt, Pnuching-bag.....J. F. Maynard
Mold and disher.....S. J. Clark
Mold-press.....D. C. Addicks
Molding-cabinet.....G. L. Waitt
Molding-maehine.....E. E. O'Neill
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Motor controller-switch, Electric.....S. M. Ward, Jr.
Musical-instrnment attachment, Self-playing.....C. D. Haskins
Musical instrument, Self-playing.....L. H. Maier
Name-holder for pews.....P. F. Denning
Necktie-holder.....L. W. Horne
Needle, Prospector's.....D. W. Jewell
Net, Hair.....P. Weill
Net, Hair.....J. Baer
Noodle-cntter.....G. B. Bretz
Numbering-machine.....S. Hollingsworth
Nut, Lock.....S. G. Mecker
Nut-lock.....J. A. Posey
Oil-burner.....J. C. Banks
Oiler, Saw.....A. P. Eckstrom
Oiling device.....R. T. Horlick
Orchard-heating device....P. H. Troutman
Oven, Portable-reel gas.....G. B. Meek
Overhead switch.....J. C. Fitzgerald
Packing, Piston.....C. E. Ross
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Panic-bolt.....A. Arens et al
Panic-bolt with adjustment between toggle and bolt.....H. G. Voight
Paper and the like, Machine for fastening.....F. H. Crabtree et al
Paper-feeding machine..3 pats.....T. C. Dexter
Paper receptacle.....L. W. Charlton
Pastry-decorating machine....J. Anderson
Pavements under water, Laying.....W. H. Fahrney
Pedal-mounting.....F. H. Hartzell
Pen, Self-filling fountain..J. A. Voglemann
Pens, Ink-holder for.....J. A. Simisky
Pencil-sharpening machine..A. S. Wheeler
Photographer's stand.....J. S. Pennington
Photographic color-filter.....R. J. Wallace et al
Photographic shutter.....A. Wollensak
Piano, Automatic.....L. Griseri
Picture-frame support.....C. E. Johnson
Picture-hanger.....G. Johnson
Pictnre machine, Moving..E. H. Sperberg
Pile, Ferroconcrete.....R. Wolle
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Pipe-cleaner.....F. R. Cunningham
Pipe coupling for cars, Steam and air....R. B. Painton
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Pipe-molding flask.....J. R. McWane
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Pipes, Apparatns for boning or laying drain.....J. M. Lockhart et al
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Plug device.....T. G. Tedesco
Pole-base.....J. B. McMillan
Pole-tip.....E. N. Robinson
Polishing-machine.....J. Pursehouse
Post-hole digger.....W. L. Stricklin
Potato-cutting machine, Seed.....B. R. and M. J. Lyster
Potato-digger.....W. I. Skinner
Power-driven machinery....D. C. Jackson
Pressing device.....F. A. Mills
Printer's galley.....M. Corrigan
Printing-press.....E. Pickering
Printing-press.....T. Winlack
Printing-press, Bed-and-cylinder.....A. T. H. Brower
Printing press, Job....J. C. Timbach et al
Projectile, Self-propelling.....W. T. Unge
Projection apparatus.....W. L. Patterson
Propeller, Reversible.....E. S. Bryant
Propulsion apparatus, Ship's..C. R. Mayhall
Protecting pad or shield.....W. H. McCormack
Pulley-rope gage.....G. W. Mack
Pulverizing machine, Sand...C. W. Herb
Pump, Oscillating-piston.....M. Keller
Pump, Tire.....C. S. Myers
Pump, Wave-operated.....C. P. Bonney
Punching apparatus.....A. J. Setter
Punching-machine.....E. Southworth et al
Punching-machines, Clutch mechanism for.....E. Southworth
Pyroxylin compound.....W. G. Lindsay
Rail-brace.....W. S. Newhall
Railway and car and appliances therefor..J. B. Fowler
Railway-brakes, Means for operating.....S. G. Neal et al
Railway-rail antispreading device.....T. B. Lindsley
Railway-rail joint.....A. C. Richey
Railway-road-bed construction.....C. R. Holden
Railway-tie.....F. Godward
Railway-tie.....J. P. Boogher
Railway-tie plate.....A. Morrison
Razor case, Safety.....R. Middledorf
Razor-stropping device.....H. E. Crandall
Reamer, Expansion.....W. P. Fouts et al
Receptacle for powder and the like.....C. A. Turner
Reflector, Electric-light.....G. F. Allom
Resilient connection device for relatively movable parts.....J. G. Nolen et al
Revolver safety device..2 pats.....J. H. Wesson
Roof-bracket.....S. P. Phoenix
Rosin-purifying apparatus....R. N. Perlee
Route-guides, ribbon-maps, and the like, Machine for operating.....O. Cullman
Rubber heel.....A. B. Heimbach
Rubber heel.....G. Hadjich
Sad-iron.....F. R. Shaffer
Sad-iron, Self-heating.....F. R. Shaffer
Sash-lock and bnrglar-alarm, Combined.....F. K. Henpel et al
Sash, Metal window.....C. A. McGinnis
Sash, Sheet-metal.....C. A. McGinnis
Saw-clamp.....F. A. Wuest
Saw-handle, Detachable...D. A. Markwith
Saw-set.....C. M. Larson
Sawing-machine.....S. N. Krawchenko
Scaffold-bracket.....C. F. Pinkley
Scale, Device for reprodncing an object on a.....G. F. Lattier
Scissors, Dressmaker's.....A. Hopkins
Screw-driver.....E. Walker
Screw-jack.....M. C. Cumming
Seal.....J. W. Aylsworth
Seal, Car.....E. E. Fairchild et al
Seal, Water.....H. H. Dow
Sealing and stamping machine, Envelop..J. J. Schermack
Sealing machine, Bottle.....E. J. Godman et al
Sealing machine, Envelop....H. S. Gibson
Self-dnmping apparatus.....J. Scott
Sewers and similar structures, Construction of.....C. F. Wilson
Sewing-machine.....F. Jacob
Sewing-machine.....F. Chatfield
Sewing-machine bobbin-winding device.....H. McFarlane
Sewing machine, Button..2 pats.....R. L. Lyons
Sewing-machine thread-cutting device.....R. L. Lyons
Shade hanger, Window.....C. N. Hiner
Shade-roller attachment.....H. Cole
Shaft spring support, Wagon..P. W. Zeller
Shearing-machine.....H. Hans
Sheet-conveying machine.....T. C. Dexter
Shoe-machine jack.....E. E. Winkley
Shoveling-board.....A. B. and M. A. Clippinger
Show-case.....C. J. Johnson
Sieve-cloth cleaner.....C. K. Kinsey
Sifter, Ash.....A. Martel
Sign-receptacle, Electrical..E. H. Freeman
Signals, Receiver for wireless transmission of.....V. Poulsen
Singeing-comb.....E. Krause
Slag-treating apparatus..R. C. Gangewere
Sleigh.....W. Walpole
Sleigh-runner.....W. Klaus
Snap-hook, Bolt.....F. W. Covert
Snap-hook for neck-yokes.....T. E. Ewer
Snow-melter.....S. B. Goff
Soldering the cap ends of cans, Machine for.....C. H. Ayars
Soles, Manufacture of.....P. Huhn
Spark-plug.....R. Jake
Speed-indicator.....W. Trafford
Speed-indicators, Signaling device for.....H. Dahl et al
Speedometer.....L. E. Blanchard
Spindle, Pneumatic.....R. H. Moore
Spinning or twisting machine yarn or thread guide.....I. E. Palmer
Splicing device.....A. F. Altheide
Spool-holder.....J. V. Newton
Spraying device.....A. Ahlen
Spraying-machine.....J. G. Mastin
Spring-wheel.....G. H. Williams
Station or street indicator....G. W. Lloyd
Steam-engine.....H. W. Weaver
Steam-generator.....R. J. Gailbraith
Steam-generator....G. M. L. Moore-Irvine
Stencils, Manufacture of.....W. H. Boone
Step or tread.....F. H. Stanwood
Storehouse, Vegetable.....J. E. Lafferty
Stovepipe and thimble.....A. P. McGuirk
Strip-cutter.....A. J. Pierce
Sulfur chloride, Making.....W. C. Quayle
Suspenders loop, Overhalls....C. E. Howe
Switch-chair.....S. T. Robinson
Switch-frog..2 pats.....H. F. Roach
Tag holder, License.....J. J. Thompson
Tapping device, Barrel.....A. M. Stock
Teeth, Treating ulcerated....F. M. Crane
Telegraph signals, Apparatus for determining the direction of space....J. S. Stone
Telephone and testing instrument, Portable.....N. Macking
Telephone attachment.....J. A. Perry
Tent, Suspended.....C. E. Mark
Tentering-machines, Feeding device for....B. Parkinson
Testing device.....J. Muchka
Thermo-electric regulator.....W. E. Mack
Ticket-case.....V. D. Hutchins et al
Tie-plates or the like, Manufacture of....J. E. York
Tightening device.....C. T. Cunnins
Tile-trimming machine..W. G. Trantvetter
Timer.....D. W. Hare
Tire.....R. Herman
Tire-holder and trunk....F. S. Suthergreen
Tire, Vehicle.....J. C. Schleicher
Tires, Composition of matter for repair of pneumatic.....J. H. Lewis
Tires, Means for automatically inflating pneumatic.....R. Connell
Tires, Mechanism for manufacturing pneumatic.....T. Sloper
Tires, Pressure-regulating device for pneumatic.....C. J. Brosnan
Tobacco-leaves, Stemming.....J. O. Morris
Tobacco-pipe.....J. R. Perry
Tobacco-stemming machine....J. O. Morris
Tool.....H. F. Jordon et al
Tool, Electrically-heated.....W. G. Clark
Tool-holder.....H. Batchelor
Tool, Hollow.....R. A. Schrag
Torpedo-shell.....E. S. Lafferty
Toy book.....J. W. Bevans
Toy handkerchief-box.....H. A. Young
Train-control system, Electrical block.....J. B. Tonnar
Tray, Collapsible.....H. M. Hays
Trowel, Adjustable.....R. W. Linville
Truck-brake.....E. D. Harding
Tube-filling machine..R. M. and C. J. Clark
Tube-forming machine, Seamless..6 pats..C. P. Higgins
Tube-making apparatus, Seamless.....M. Altman
Tumbler-holder.....W. A. Younie
Tubes, Mechanical joint for vacuum.....D. M. Moore
Tubing, Apparatus for hoisting.....G. W. Oakes
Tug attachment for harness, Equalizer....H. D. Balcom
Turbine-blade.....H. H. Wait
Turbine, Reversible steam....F. C. Beyerle
Twyer-iron.....J. Kolstrom
Type-setting machine for various sizes of type.....C. A. Albrecht et al
Type-writer back-spacing device.....G. A. Smith
Type-writer cabinet.....E. Baltzley
Type-writer marginal-stop device.....G. A. Smith
Type-writing machine.....L. S. Burridge
Type-writing machine.....O. Woodward
Type-writing machine.....W. E. Barnard
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Type-writing machine.....F. A. Young
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Umbrella, Folding.....F. F. White
Universal joint.....S. C. Moorhead
Unloading apparatus.....B. Bertke
Valve.....T. Shade
Valve.....G. G. Little
Valve, Combined check and gate.....J. H. Stickel
Valve device.....J. Slorach
Valve for carbureters and other apparatus.....A. E. England
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Valve for sewers, Check..C. J. E. Carlson
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Valve-gear for steam-locomotives, Slide.....A. Jendrusik
Valve mechanism.....C. W. Everson et al
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Valve, Steam-regnlating..W. F. Kiesel, Jr.
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Vamp-trimming machine.....O. Ashton
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Vehicle and like hood, Motor....J. S. Cree
Vehicle, Motor.....A. F. Rockwell
Vehicle-seat, Supplementary..F. F. Breihan
Vehicle signal, Motor.....R. M. Pierson
Vehicles, Means for locking the steering mechanism of motor.....A. B. Walters
Vending-machine.....H. Werden
Vending-machine.....W. E. Hales
Vibrating screen or separator.....T. L. and T. J. Sturtevant
Vibratory apparatus, Valve-operated mechanism for handles of...C. M. Seibert, Jr.
Voltage-regulator.....C. S. Johnson
Wagon-brake.....D. Meek
Wall tie or bond.....A. C. Decker
Walls, Fastening means for..H. E. Jerauld
Washpail.....G. H. Reeves
Watch-holder for motor-vehicles.....H. T. Adams
Watchmaker's loop.....W. Faustman
Water-closet connection.....J. J. Cosgrove
Water-meter.....E. E. Gamon
Water purifier and clarifier...J. E. Angell
Weather-strip, Adjustable.....C. Anderson
Wedge.....J. L. Thomas
Weight-motor.....J. A. Wilson
Wheelbarrow.....J. M. Harris
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Windmill.....A. M. Vold
Windmill.....J. A. Swanson
Windmill.....L. C. Matthews
Window adjuster, Casement..G. L. Wilkins
Window, Double-sliding-sash.....J. Mayr
Window-fastening device.....J. L. Mallory
Window-ventilator.....H. C. Bunnell
Wire-drawing block.....H. B. Humphrey
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Wire stretcher and splicer...H. C. Jacobs
Wood, Coloring and fireproofing..W. A. Hall
Wool, Apparatus for removing the grease and yolk from.....R. Vandatte et al
Wrench.....H. Henricks
Wrench.....A. C. Howe
Wrench.....R. A. Montgomery
Wrench.....G. E. Miller
Wrench.....I. J. Basken
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Yarn and making same....J. G. Harrison
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Carton.....L. Hirschfield
Casket handle-plate.....F. K. Allen
Casket name-plate.....F. K. Allen
Dish or similar article.....H. Creange
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Stove.....W. L. Bertram
Tureen or similar article.....H. Creange
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Air-cooled engine.....W. J. Miller
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Airship.....G. D. S. Reece
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Amalgamator.....A. J. Smith et al
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Band-cutter and feeder..G. E. Morris et al
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Bats, Machine for compressing and rolling.....S. M. Ball
Battery-receptacle and bell-snpport, Combined.....J. L. Koerher
Bearing, Centrifngal oiling...F. A. Warren
Bearing-finder.....R. Huntington
Bearing, Roller.....J. F. Foster
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Bottle, Indicating.....W. T. Cassidy
Bottle, Non-refillable.....W. M. Way
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Box-cover fastener.....C. A. Lauzon
Box-cover fastener.....B. Tnkis
Box-covering and corner-staying machine.....W. C. Carlson
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Brake-head, Adjustable..C. H. Williams, Jr.
Brass-polishing device.....C. E. Merrill
Bridle-bit, Reversible.....E. M. Coe
Broom.....J. M. Zimmerlee
Buckle, Trace.....W. W. Welch
Building-block mold.....J. W. Bragstad
Building constrnction, False work for.....A. Arnn
Bulletin-board.....G. H. Parker
Burglar-alarm systems, Electric cable for..J. P. Williams
Burner.....F. E. Fender
Burner attachment.....T. Moweomber
Burners, Heat-distributing top for.....A. B. Coleman
Button-fastening device.....B. Joachim
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Cabinet, Thread.....J. A. Witt
Cables and the like, Winding-head for armoring.....E. Witzenmann
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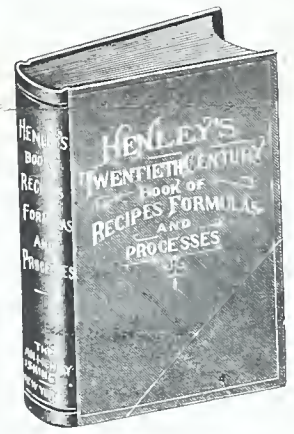

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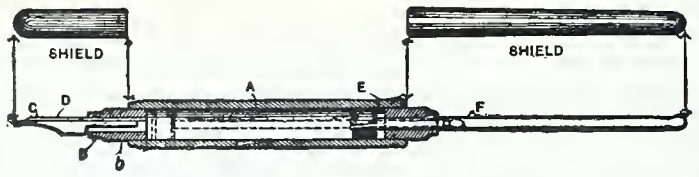

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THE CHAMONIX-MARTIGNY ELECTRIC RAILWAY.

By C. VAN LANGENDONCK.

THE Chamonix-Martigny · Chatelard electric railway is enabling the tourist to pass between France and Switzerland by a new route, which will take three hours instead of nine by diligence, and give him the additional advantage of being conveyed through magnificent views of the noblest chain of the Alps.

The line is a narrow gauge. Continuous current at 600 volts and a raised third rail are employed, the current being conveyed to the motors by means of shoes suspended from the latter. The live rail is fed at intervals by wires from power stations, the conductors are carried on ordinary telegraph poles which are placed nearer together than usual on account of the great weight of the wires. The line is worked partly on the adhesion and partly on the cog principle, but the cog section is entirely confined to the Swiss end.

The first portion of the line between Chamonix and Argentiere is five miles in length, with intermediate stations at La Praz and Les Tines. Beyond the latter, which is situated at the foot of the Mer de Glace, the mountainous part of the line really begins. At the French terminus the railway climbs 400 feet, Argentiere being about 450 feet higher than Chamonix. Argentiere is a considerable village, where the huge glacier of that name descends into the valley of the Arve. After leaving the station here the line passes quite close to the glacier, ascends the gentle slope of a cold morain, and then curves to the east towards the Col de Balme. Opposite the village of Frasserands the line doubles back to the west, and after crossing the Arve river for the last time by means of a fine masonry viaduct, enters a tunnel under the Col des Montets, about three quarters of a mile long. Owing to the intense hardness of the rock the piercing of this tunnel proved a very arduous undertaking. On emerging from the tunnel the line is fairly level till it arrives at the village of Vallorcine. From this point to Chatelard the road keeps close to the river, the valley of which grows so deep and narrow that skillful engineering was necessary. For a distance of one and a quarter miles it is compelled to run terraced on a wall of rock, the terrace terminating in a tunnel through a rocky spur 338 feet long.

At Chatelard the two roads to the Rhone Valley separate, one proceeding to the southeast over the Tete Noire to Martigny, and the other running almost due north to Vernayaz. The railway keeps fairly close to the latter, which although very narrow and practicable only for light vehicles, is more picturesque than the former. After leaving Chatelard, the line at first creeps along the flank of the mountain, now boring through dense pine forests and now traversing open ground, where passengers can look across the deep ravine of the Eau Noire to the Tete Noire pass on the eastern side. The ascent presently grows steeper, and after threading three short tunnels, and passing over an important viaduct, the station of Finhaut, 4060 feet above sea level and the top of the line, is reached. Finhaut enjoys a beautiful situation

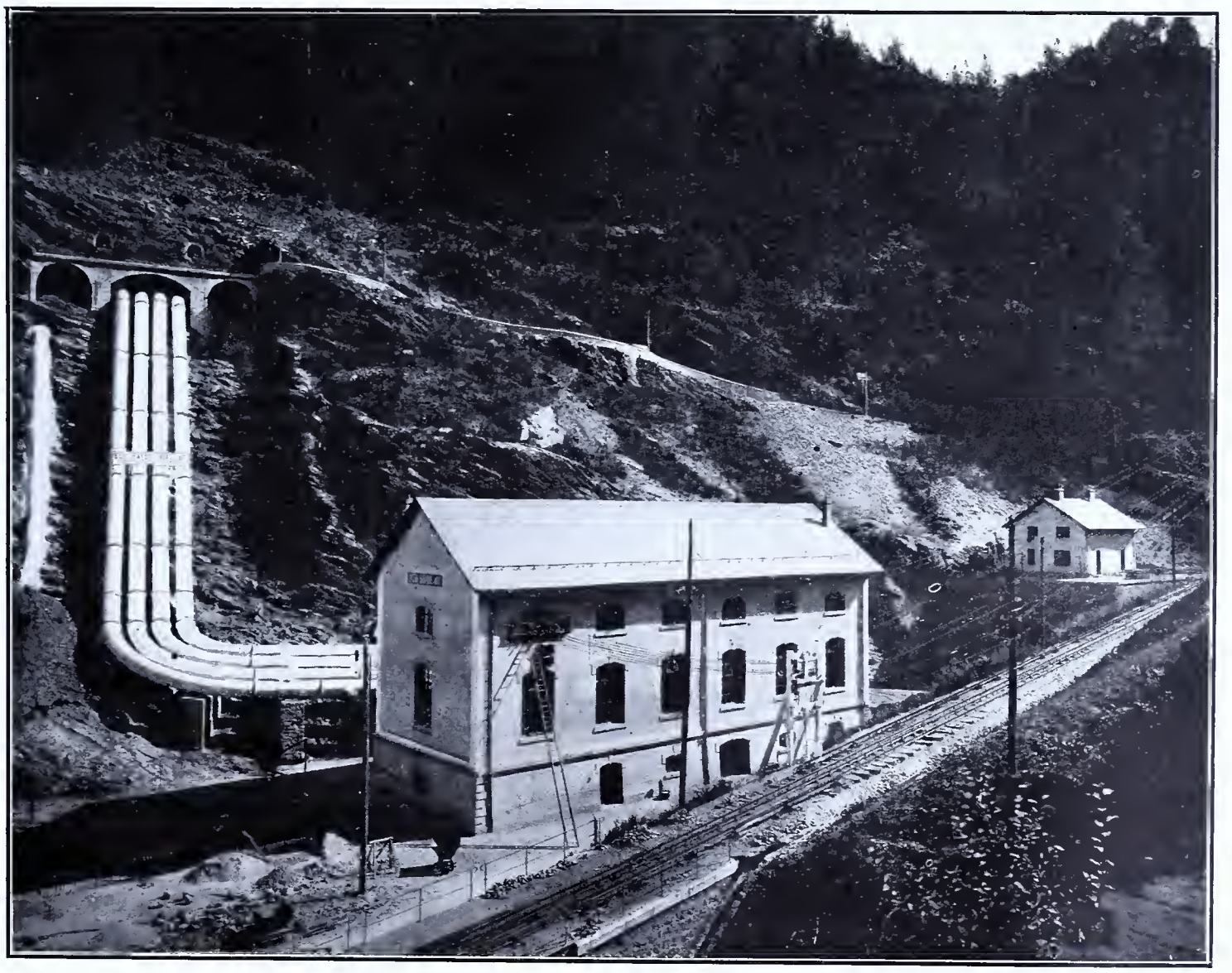


FIG. 1.—VIEW OF LINE NEAR THE ELECTRIC GENERATING STATION.

with a superb view of the Trient Glacier (Fig. 2.). It is a very popular resort for English and American tourists. Beyond Finhaut the line approaches the remarkable series of chasms known as the Gorges du Trient, the whole forming a ravine seven and a half miles long, worn by the glacier which at one time extended into the Rhone Valley. Passing through three more short tunnels, two of which are only protective measures against avalanches, the hamlet of Triquent is passed, and a little further on the way is split by a enormous fissure, down which a torrent from the glacier foams and boils. The line is carried over this gaping crevasse by means of a masonry bridge, having a single span of 114 feet, the level of the rails being 196 feet above the bed of the stream.

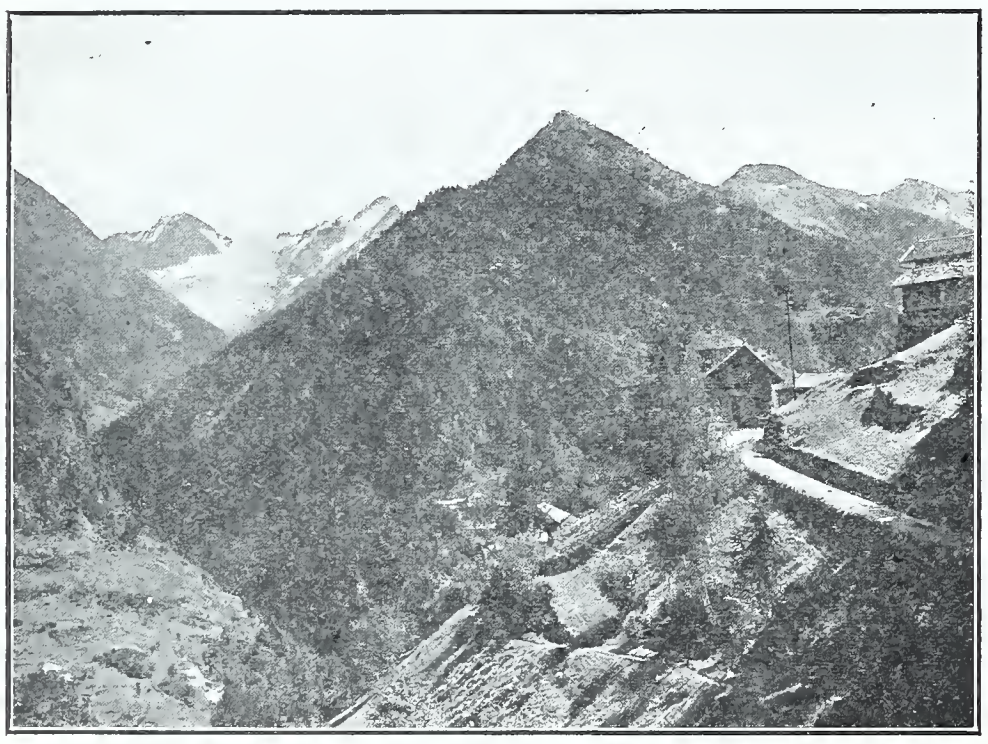


FIG. 2.—TRIENT GLACIER VIEWED FROM THE LINE.

From Salvan to Vernayaz, the line descends 1500 feet in two miles. In order to accomodate itself to this sudden difference of level, recourse is had to a cog-rail, while the line also makes a spiral curve, completely doubling on itself, the upper portion being hollowed out of a wall of rock overhanging the valley. The railway reaches the Rhone Valley near to the entrance to the celebrated gorge, where the rocks, 420 feet in height, approach each other so closely that the view at the mouth of the ravine almost resembles a huge vaulted cavern. From Vernayaz (1535 feet) the electric line runs along the cantonal road for four miles, parallel with the Jura Simplon railway, to Martigny, its terminus.

The electric power for working the line between Chamonix and Chatelard is generated at Servoz by means of three dynamos, each developing 20,000 horsepower, which are worked by turbines, whose motive power is the river Arve. That stream is diverted by means of a gigantic sluice near the Port St. Marie into a tunnel in the side of the hill, and comes out lower down the valley in several immense tubes. (see figure 1.) The generating station for the Swiss line is situated near Salvan, the power being derived from the Cascade du Dalley, a fine fall of the Salanfe. The traffic is handled both by electric locomotives and auto-motor cars. The locomotives weigh 30 tons each, and the passenger auto-cars 35 tons. The latter are 55 feet in length and accomodate 100 passengers together with their luggage.

The rail journey between Martigny and Chatelard occupies one hour and fifty-five minutes, and between Chamonix and Argentiere a half an hour.

Making Diamonds.

The process of producing diamonds artificially has long been a dream of the experimenter. The conditions under which diamonds are created in nature are pretty well understood, and on a small scale they have for some time been duplicated in the laboratory, and even—though here unwittingly—in the workshop. Nothing more is necessary than to reduce carbon—a bit of coal or graphite or lamp black—to a liquid condition, combine it with a solvent, and maintain it under great pressure until it cools, when crystals of the pure carbon will form just as do crystals of quartz or sugar or salt under like conditions — and these crystals of carbon constitute true diamonds. But the difficulty lies in the extreme reluctance with which carbon assumes the liquid state. Under pressure, to be sure, it will liquefy; but the pressure required is about fifteen tons to the square inch. In the depths of the earth, such a pressure may be applied by the weight of geological strata, but how may it be attained in the laboratory?

A most ingenious answer to this question was found by Prof. Henri Moissan of Paris. It is based on the well known fact that the metal iron has the property—which it shares with a few other substances, including water—of expanding instead of contracting as it passes from the liquid to the solid state; combined with the further fact that liquid iron absorbs or dissolves carbon, much as water does sugar, in increasing quantity with increasing temperature. Moissan fills an iron receptacle with pure iron and pure carbon obtained by calcining sugar, closes it tightly and rapidly heats it to the highest temperature obtainable in the electric furnace, bringing it to a degree of heat at which the lime furnace begins to melt and the iron volatilizes in clouds. The dazzling fiery receptacle is then lifted out and plunged instantly into cold water, until its other surface is cooled and hardened, thus forming a shell of iron that holds the interior contents with an inflexible grip. As this molten matter cools, the carbon separates from the iron solvent in liquid drops, and under the almost unimaginable pressure of expansion of the solidifying iron, these liquid drops become solid crystals of diamond.

Sleeping Cars on Electric Lines.

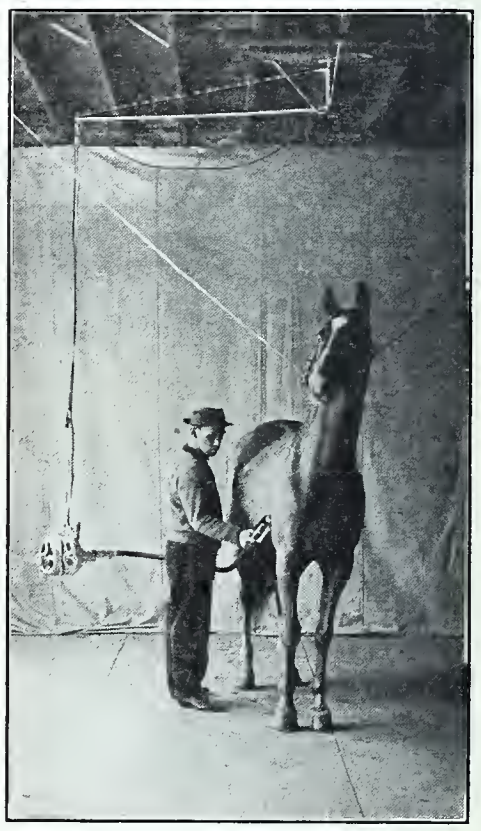
Great progress has been made in the course of the past few years in the comforts afforded the patrons of sleeping cars, so that what was once considered a rolling luxury is now, compared with the modern car, an inconvenient vehicle. But the most notable advance in this line has been made by those systems which make use of electricity instead of steam as a tractive power. On one of the interurban systems in Illinois, the through night trains are provided with sleeping cars so built that passengers need not be disturbed except just before retiring and just after rising. The inconvenience of smoke is of course eliminated, and one of the first things that delights the passenger who takes an upper berth is the sight of two good sized windows, which ensure him all the fresh air he wants. The berths can be swung and locked to the side of the car, but can be taken off and carried outside for cleaning, which in itself is a great advantage over the general run of sleeping car berths. In addition to the features of fresh air and sanitation, these cars are arranged so that upon arising the downstairs passenger may swing the berth up into place and have a comfortable dressing room in the space between the floor and upper berth, a neat leather folding chair being supplied. In the side wall at each berth is a steel, plush-lined locker with yale lock, the key of which the passenger holds. But in order to open it, the master key of the conductor has to be brought into service also, thus insuring safety for valuables. Each berth is supplied with two storage battery electric lights.

ELECTRO-PNEUMATIC HORSE GROOMER AND CLIPPER.

By FRANK C. PERKINS.

An electric pneumatic horse grooming and clipping machine, of recent design, is remarkable as a labor-saving device. It consists of a variable speed electric motor, operating at from 100 to 5,000 revolutions per minute, and equipped with a flexible shaft of piano wire woven into a cable a half an inch in diameter.

A cleaning brush of china bristles is used, driven by friction, and so arranged that it will stop instantly should it accidentally catch the mane or tail. A pneumatic attachment has been devised to utilize the current of air arising from the rapid rotation of the brush, to protect the operator from dirt and to deposit the same on the floor.



It is stated that the cost of electric current for operating this electro-pneumatic horse grooming and clipping machine is less then $5.00 a month on fifty head of horses. The machine can be changed instantly from a grooming to a clipping machine and may be run either fast or slow as desired, cleaning a horse wet or dry, and removing anything that can be removed with a curry comb and brush in half the time required by hand.

The motor is suspended from a swinging arm attached to the ceiling, a flexible cord extending from the motor to the support and the current being supplied from an ordinary incandescent lamp socket if desired. The pneumatic brush removes the fine, dry dust which it is impossible to extract with an ordinary hand brush, and it is maintained that from $600 to $1,000 per year may be saved in labor alone, in grooming and clipping fifty head of horses with this device, while the horses are cleaned more thoroughly than in any other way.

Disappearing Car Steps.

The board of supervising engineers of Chicago are testing a device intended to reduce the number of street car accidents, and at the same time to overcome the difficulty of the high step—a subject to which street car authorities have been giving much attention for the last few years. In the new device, the steps fold out of sight when the car is in motion, and become available only when the coach has come to a full stop. The vestibule door at the front end of pay-as-you-enter cars, remaining locked until the car stops, has served to prevent "flipping" and consequent mishaps. It is claimed that the disappearing car steps will do as much to secure safety at the rear platform.

As the steps are two in number, the inventor believes that boarding and leaving cars will be made easy for persons who find the present ascent too strenuous. They are folded under the car when it is in motion, being operated by a continuous lever, and their greater projection will not cause collisions with the hubs of passing vehicles, an objection formerly offered by plans for two-step cars.

By an enlargement of the idea of the disappearing step, a disappearing fender is also proposed, and this will be tried simultaneously, though it may be applied independently. This fender when in action drops down till it rests upon the rails, small wheels or rollers supporting it. Ordinarily, however, it is wholly out of sight under the car platform.

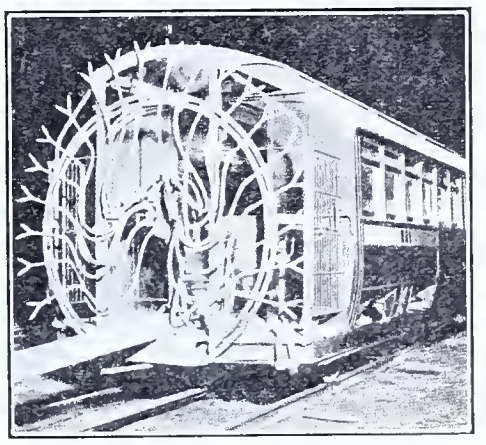
Extending around the steel front of the car near the ground, and so designed that it appears to be a part of it, is a bumper. If a car strikes a person the pressure on the bumper automatically releases the fender, which drops with a scooping motion, aimed to catch up the person hit and hold him safe from contact with the wheels. It may also be released by the hand or foot of the motorman.

Motor Snow Plows.

Snow plows worked by steam engines are familiar sights in winter on our western railroads, but a motor snow plow is a novelty in the streets of a large city. They were used with good results, however, in Berlin during the past year. Immense quantities of snow fell in Germany in the winter, and municipalities had difficulty in removing the masses from the streets. Thousands of workmen, teams, carts and snow plows were employed, costing, in Berlin, about $15,000 a day, and yet it would take a week to fully clear the way for traffic after each storm. Finally the motor car was pressed into service. To the front of a six-ton truck, of 32 horsepower, was fastened a wooden plow of triangular shape, and this was driven through the huge snow piles, cutting a fine path. The great advantage of motor snow plows, besides the strong power, lies in the fact that the driving wheels are always on that portion of the road already cleaned, while the horses must wade through the deep snow before it is removed.

SUBWAY DEVELOPMENT.

Americans are in the habit of comparing all great enterprises with the Panama Canal, and this serves to dwarf most other tasks. In a sense, it is the most gigantic work in history; but the great engineering projects that are now being carried on around and beneath the city of New York, taken collectively, make the canal look like a sort of irrigation ditch. Over six hundred million have already been appropriated for these vast enterprises, and the end is not yet. Plans that will be completed within the next decade call for the expenditure of at least a billion more. The total which conservative engineers estimate will be spent in this direction about the metropolis before 1920 will be enough to build eight Panama canals.



WHITEWASHING THE TWOPENNY TUBE

Sixteen tunnels run under the rivers that separate Manhattan Island from the main land on either side. Eight of these are under East river, six under the Hudson and two under the Harlem. Six more are projected from the Brooklyn Bridge to the Battery, and four under the Harlem, and two above the Williamsburg bridge. In all the rest of the world put together, there are not as many miles of subaqueous tunnels as there are being driven under the rivers of that city.

The great development of tunnel work in the past two decades is due primarily to the invention of an English engineer, who, in 1889, planned a cylindrical tunnel shield. The equipment about the same date of the first trolley line, made the tunneling of rivers a feasible proposition. Electric power is essential in long tunnels, and without the shield it would have been impossible to drive a tunnel through the soft ground under the Hudson. When all the tunnel and subway systems now under construction are completed, it will be possible for a person to go to any portion of the city, north, south, east or west, without leaving a tunnel, after he has once entered it. Likewise, he will be able to get off the city subway cars and take a train to any station in the United States without again coming above ground.

The first underground tunnel ever built was in London, in 1846. The first underwater tunnel to be constructed was that of the city of Chicago, which bored under Lake Michigan for some distance to get a pure water supply. Since then the system has spread to many other cities and other countries. Paris has a most elaborate system of subways, finding to her cost in the recent flood that her work was that of a modern Frankenstein. But the subway has come to stay as a means of urban transportation. There are many annoying little details, such as ventilation, that have not been settled entirely to the satisfaction of the traveling public, but the chief engineering difficulties have been solved. The lighting of the tunnels, and the diminution of noise, are subjects that are receiving attention at the hands of those in authority. All subways are painted white, and it is interesting to note the device adopted by the owners of the London "two-penny tube" to keep this color, which materially lessens the gloom of the trip. The enclosed illustration shows a whitewashing device, which is run through all the tubes late every night, after the passenger traffic has ceased. The car carries a huge tank of whitewash, and an electric pump forces it through the web of pipes at the end of the car, and sprays it over every part of the tunnel.

Subways represent the most satisfactory means of transport. The first cost is heavy, but the cost of maintenance is not to be compared with that of elevated roads.

Nowhere in the planet are such traffic facilities demanded as in New York. Its peculiar geographical location, and its enormous growth in population, offer special problems. It is thought that the subway will solve these. At 34th St. and 4th Avenue is perhaps the most remarkable railroad construction in the world. Deep underground runs the Pennsylvania tunnel; above that is the subway; above that is the subway surface car line; over them is the surface line itself; and not far away is the elevated road, making five stories of traffic. New York spends more money per capita, it is said, than any other city on earth for public improvements, and certainly for underground railways.

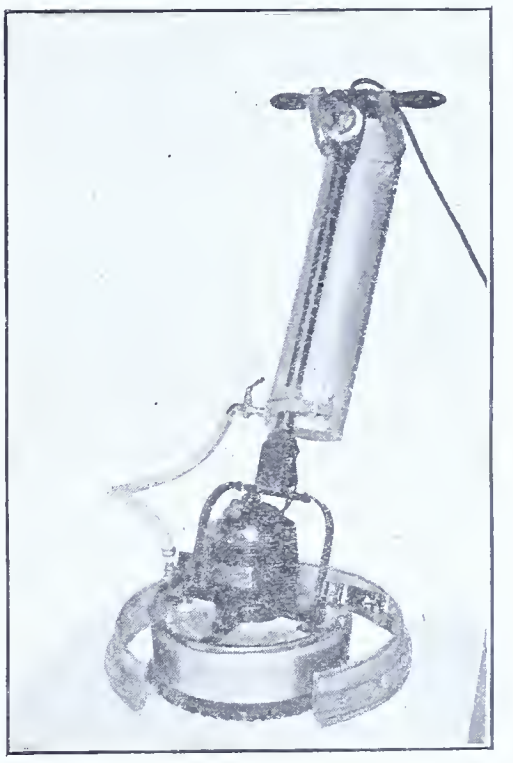
Telephones Over 1800 Miles.

By the use of a microphone which raises the human voice two and one-third octaves, conversation was carried on successfully over a telephone circuit reaching from New York to Pittsburg and Chicago and return, a distance of 1,825 miles. The voice, it is said, came back from its long trip as clear as a bell. The telephone instrument used in the test is but slightly different in appearance from those ordinarily used on standard lines, but the voice is received on a microphone. A special combination of drums raises it two and one-third octaves, and it is sent over the wire at that pitch. The waves being very sharp and short, travel rapidly, and the receiver at the other end, through another combination of drums, reduces the vibration, so that the voice is heard in its normal speaking tones.

ELECTRIC FLOOR SCRUBBING MACHINE.

By Frank C. Perkins.

Many contrivances have been designed from time to time for the purpose of renovating floors by machinery, and every house owner knows there will be a monthly saving if he can secure the proper machine for the particular purpose. The apparatus herewith shown promises to fill this need. It weighs less than fifty pounds, and can be attached to any electric light fixture. It is extremely simple in construction, and all working parts are packed in grease and enclosed within a dust and waterproof case. There are no belts, no chains or moving parts exposed to break furniture, damage woodwork or maim the operator. Owing to its peculiar construction, it will scrub the inequalities of the floor as well as the high places, and be under absolute control at all times.



The handle is kept slightly below the working position, allowing the entire weight of the machine to rest on the casters. After starting, the handle is raised, withdrawing the casters, and the machine is propelled over the surface, moving water and ring with it. By the use of this ring the bulk of the water is kept with the machine, which eliminates extra work in mopping up, in fact on terrazzo and marble floors it suffices to wipe the floors with a clean mop. The tank can easily be removed and the machine used for other purposes by putting on different attachments.

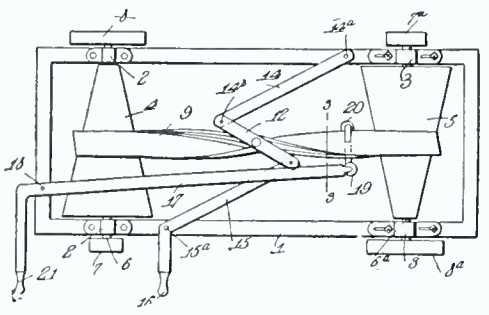
It is maintained that this machine is also a great labor-saving device for removing varnish, paint and stain, with the aid of steel brushes and chemicals. An unsightly floor can be cleaned down to the natural wood, then sand-papered smooth for finishing, and finally waxed and polished, all of these operations being accomplished with the same machine by applying the different brushes or disks. The machine is now being used extensively for smoothing down mosaic floors after they have been rough troweled, the saving of labor by this method being important.

CLEVER NEW PATENTS.

Transmission Gearing.—Match Scratching Attachment.—Waterproof Footwear.

Transmission Gearing.

A gearing for the transmission of power at variable rates of speed, which will permit a change of speed by degrees while the power is being transmitted, without stopping the motor or injuring the mechanism, has been recently patented by Abiram J. Slonecker, of Trenton, Mo. The invention—a plan view of which is given in the accompanying cut—provides

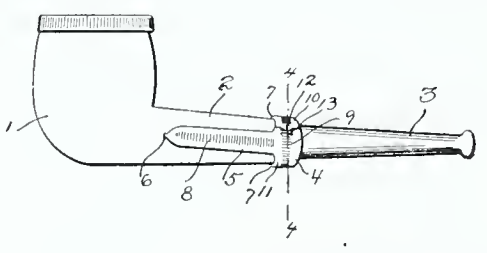


means by which a belt connecting two cone pulleys may be shifted to the smaller end of one of said pulleys, and thus loosened to such an extent that no motion will be transmitted. As will be seen in the drawing, the shafts 6 and 6*a* of the cone pulleys 4 and 5 are journaled in suitable bearings. The axis of the cone pulleys are parallel to each other, and their apexes point in opposite directions. The shaft 6 carries a small drive pulley 7, and a large drive pulley 8, either of which may be used for transmitting power. On the shaft 6*a* is mounted a small pulley 7*a* in line with the pulley 8 and a large pulley 8*a*, in line with pulley 7. The cone pulleys 4 and 5 are connected, and one is driven by the other through an endless belt 9, which is crossed between said pulleys, and one edge of which is thicker than the other, in order that it may snugly fit the cone pulleys. The planes of each side of the belt diverge at the same angle as that of the taper of the surface of the cone pulleys.

A belt shifter carriage 12 is hung between the cone pulleys, and carries a roller which works between the two runs of the belt 9 at the crossing, and prevents the two opposite faces of the belt from touching and wearing upon each other. The carriage shifts the belt along the pulleys, and thus changes the speed. It is supported at one end by a link 14, and has at the other end a pivoted lever 15. At 17 is shown a lever fulcrumed on the frame, its free end carrying idler rollers 19 and 20, between which the belt 9 travels. The free end of the lever 17 is made to throw the belt from the larger to the smaller diameter of the pulley 4. The roller 19 extends perpendicular to and is engageable with the wide edge of the belt. The periphery of the roller 20 is grooved to receive the thin edge of the belt, and this roller is slightly inclined to make a better contact with the belt. When it is desired to decrease the speed, the belt 9 is shifted to the smaller end of the pulley 5. To increase it, the belt is shifted to the larger end of the pulley 5 and simultaneously to the smaller end of the pulley 4. The belt is thus shifted by operating the lever 15, the lever 17 being left loose so that the belt may change its position on both pulleys. To stop the power, the lever 17 is operated, and the belt 9 is thrown loose and free from the surface of the pulley 5, by moving it to its smaller end, and the belt is thrown into action by a reverse motion of the lever 17. By moving the belt to the small end of the cone pulley 5, it is loosened so that no motion is transmitted. When the belt is thus shifted, it is held against lateral movement intermediate of its ends by the roller, the frame carrying said roller being held stationary, so that the position of that portion of the belt which is traveling over the pulley 4 is not disturbed, and only that part of the belt which is between the roller and the pulley 5 is shifted by the parts carried by the lever 17.

Match Scratching Attachment.

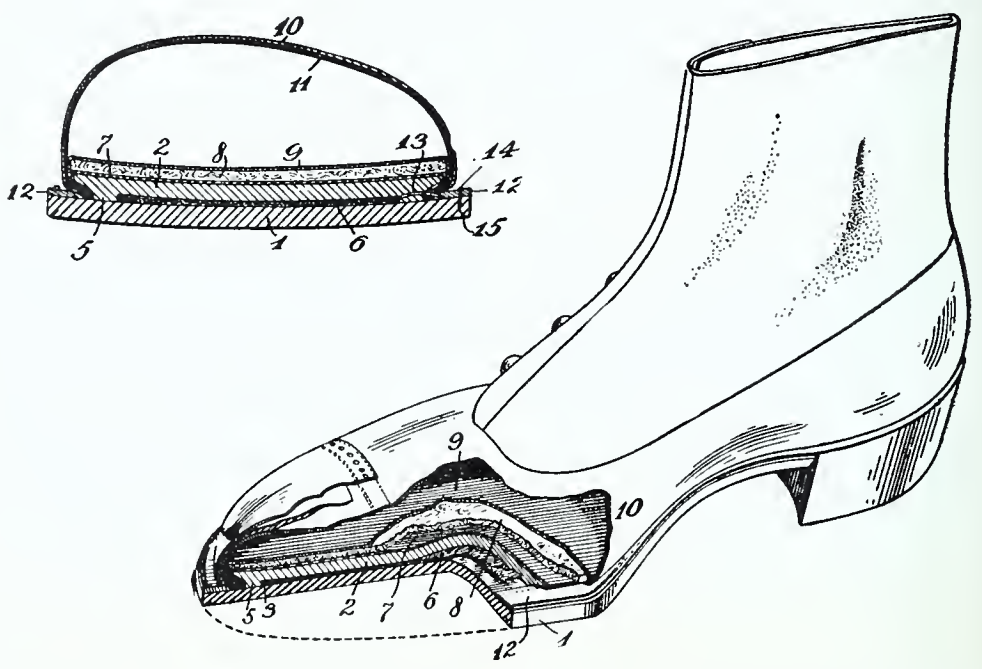
A pipe with an attachment on which matches may be scratched, and the pipe readily and conveniently lighted, is among the latest novelties. The device, which was invented by Herbert C. Joiner, of Sweetgrass, Montana, may be readily detached when desired, and when applied to the pipe, serves to strengthen and brace the stem. The pipe, which is illustrated herewith, is provided with a metal ferrule 4, split so that its ends may overlap and fit over the end of the stem, and having elongated strips 5 extending along the stem and detachably secured



thereto by means of a pin 6 at the end of each strip, which may be pushed into the wood of the stem. Pins 7 serve in like manner to hold the ferrule in place, though it may be readily detached from the stem by pulling it therefrom. The strips 5 hold the ferrule in place and also brace the stem, and these strips, as well as the ferrule, have serrated surfaces upon which a match may be ignited. In order to attach the ferrule to pipes of different sizes, it is formed with overlapping extensions 10 and 11, the former being provided with a barb 12 which is adapted, with the ends of the ferrule overlapping each other, to engage in the stem through the slits in the extension 11, or to be bent over and secured in the opening, thereby adapting the ferrule to various sizes of pipes. The ferrule may also be made in the form of a ring, to fit around the rim of the bowl of the pipe.

Waterproof Footwear.

In view of the high price and the poor quality of rubber, and the discomfort involved in wearing shoes of this material, manufacturers have for years been striving to put on the market leather footwear that will be practically waterproof. A long step in this direction has been made in a recent patent granted an Ohioan, Mansfield M. West, of Cleveland. A shoe is provided the sole of which is practically impervious to moisture, this being effected by cementing a sheet of rubber to the upper surface of the inner sole, and folding it down about the edges. This sheet, as well as the upper and the linings for the shoe, are held to the sole by stitches which pass through the shoe welt, the upper, the linings and said sheet, and through the channeled portion of the inner sole. As seen in the accompanying drawings, (which give a perspective view of a shoe with portions cut away to show the construction, and a cross section through the shoe) the inner sole has a channel and the outer edge is cut away on the under side so as to provide a bead 5. Between the channels on the under side of the inner sole, the material of the sole is hammered down to form a depressed portion, which latter is filled with cork, tarred felt, or some such material. Cemented to the upper surface of the inner sole is a sheet 7 of water-



proof material, which is passed about the edges of the sole and is cemented to the outer edges of the cut away portion, so as to prevent moisture. Upon this sheet is placed a cushion of felt or lambs' wool, and upon this again rests the inner or "sock" lining 9, which extends beyond the cushion and the inner sole, so that the same may be folded down along the edges of the waterproof sheet within the cut away portion. The upper 10 and inner lining 11 likewise pass down along the folded portions of the "sock" lining and waterproof sheet, while the welt 12 surrounds the outer edges of the upper. These several parts are held together by stitches 13, which extend through the bead 5 of the inner sole from the channel outward, through the waterproof sheet, the "sock" lining, the upper and its inner lining and also through the welt, these parts being tightly drawn together to prevent the entrance of moisture. The outer sole is then secured to the welt 12 by stitches, which are embedded in a slit in the latter and so protected from wear.

It will be seen that though water enters the shoe about the welt, it cannot be absorbed upwardly, but is directed down to the outer sole, into which it drains.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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UNION CARBIDE CO. v. AMERICAN CARBIDE CO.

(Circuit Court, N. D. New York. August 2, 1909. 172 F. R. p. 136.)

PATENTS—INFRINGEMENT—PROCESS OF PRODUCING CALCIUM CARBIDE.

The Wilson patent, No. 563,527, for a process of producing calcium carbide by subjecting lime and a carbonaceous deoxidizing agent to the heat of an electric arc in an electric furnace, construed, and held not infringed.

LIEBIG'S EXTRACT OF MEAT CO., Ltd., v. LIEBIG EXTRACT CO.

(Circuit Court, S. D. New York. May 4, 1909. 172 F. R. p. 158.)

1. TRADE-MARKS AND TRADE-NAMES-NAMES SUBJECT TO APPROPRIATION--"LIEBIG."

The name "Liebig," as applied to extracts of meat, has been in common use by many in this country for many years to designate preparations supposed to have been made by Liebig's process, and is common property, which no longer designates, if it ever did, the product of a particular manufacturer.

2. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—IMITATION OF CORPORATE NAME.

"Liebig's Extract of Meat Co., Limited," an English corporation, held not entitled to an injunction to restrain the "Liebig Extract Company," of New York, from using its own name in a competing business in this country; the defendant having adopted and continuously used the name since a time before complainant began to sell its product here.

CROWN CORK & SEAL CO. OF. BALTIMORE CITY v. BROOKLYN BOTTLE STOPPER CO. et al.

(Circuit Court, E. D. New York. July 15, 1909. 172 F. R. p. 225.)

1. PATENTS-INFRINGEMENT-MACHINES SOLD UNDER LICENSE CONTRACTS-VIOLATION OF CONDITIONS.

A manufacturer of patented machines for applying a special pattern of seal or cork to bottles may lawfully sell such machines under license contracts binding the purchasers to use the same only in connection with seals or corks made by the seller, and a violation of such contract by an original purchaser, or by a secondhand purchaser having knowledge of such restriction, will constitute an infringement of the patent.

2. PATENTS — CONTRIBUTORY — INFRINGEMENT.

Complainant made machines for applying a special form of seal or cork to bottles, protected by patents, which it sold only under license contracts providing that they should be used only with seals or corks made by complainant, which were not protected by patent. Its machines were practically the only ones in use in this country. Defendants, with knowledge of such facts, made a similar seal, which could be used on complainant's machines, and sold the same to all whom they could induce to buy: the result being that they were chiefly bought for use and used on complainant's machines. Held, that defendants were chargeable with contributory infringement of complainant's patents, and would be enjoined from selling their product to any purchaser who was bound by the restrictions of complainant's license contracts.

3. PATENTS — SUIT FOR INFRINGEMENT—PARTIES LIABLE.

Individuals, who organized a corporation with a small capital for the sole purpose of enabling them as individuals to make and sell an infringing article through the corporation without being subject to personal liability, may be joined with the corporation as defendants in a suit for the infringement and held jointly liable therefor.

ARMSTRONG v. BELDING BROS. & CO.

(Circuit Court, D. Connecticut. July 6, 1909. 172 F. R. p. 234.)

PATENTS — VALIDITY AND INFRINGEMENT — THREAD PACKAGE.

The Schroeder patent, No. 546,251, for a thread package, is a pioneer patent of merit, and entitled to a liberal construction, being the first device for packing individual skeins of embroidery silk which protected them from being tangled and soiled, and enabled the user to draw out the silk thread by thread without breaking the package The Schroeder patent No 546,123, is also valid as covering a specific improvement on the package of No. 546,251, which was the earlier invention. Both patents also held infringed.

CASEIN CO. OF AMERICA v. A. M. COLLINS MFG. CO.

(Circuit Court, E. D. Pennsylvania. July 21, 1909. 172 F. R. p. 237.)

1. PATENTS—PRIOR USE—ENAMELING COMPOUND FOR COATING PAPER.

The Hall patent, No. 626,537, for enameling compound for surfacing paper and method of producing the same, is void for prior use of the compound for many years, produced by the same method.

2. PATENTS—PRIOR USE—ENAMELING COMPOUND FOR COATING PAPER.

The Hall reissue patent, No. 11,811 (original No. 609,200), for an insoluble waterproof compound for coating paper, etc., is void for prior use of the same or similar compound for more than two years prior to the application.

UNITED STATES v. PATTERSON.

(Circuit Court D. Oregon. August 9, 1909. 172 F. R. p. 241.)

PERJURY—FEDERAL STATUTE-OATH TO APPLICATION FOR PATENT.

A willfully false statement in an oath to an application for a patent, made as required by Rev. St. § 4892 (U. S. Comp. St. 1901, p. 3384), that the applicant verily believes himself to be the original, first, and sole inventor of the device for which the patent is sought, is of a material matter, and constitutes "perjury," within Rev. St. § 5392 (U. S. Comp. St. 1901, p. 3653).

WESTINGHOUSE ELECTRIC & MFG. CO. v. TOLEDO, P. C. & L. RY. CO.

(Circuit Court of Appeals, Sixth Circuit. July 29, 1909. 172 F. R. p. 371.)

1. PATENTS-CONSTRUCTION-PAPER PATENTS.

While the fact that the device of a patent has never been put in use does not affect the validity of the patent, it is ground for giving it a strict construction.

2. PATENTS—VALIDITY-PRESUMPTION FROM ISSUANCE.

The presumption of the validity of a patent arising from its issuance is weakened by the fact that certain prior patents, claimed to anticipate, were not cited to nor considered by the examiner.

3. PATENTS—ANTICIPATION-ELECTRIC CONTROLLER.

The Brown patent, No. 618,163, claim 6, for a method of electrical control, designed to secure an acceleration of speed of motors and at the same time protect them from injury, is void for anticipation by the Potter patent, No. 524,396.

NATIONAL DUMP CAR CO. v. RALSTON STEEL CAR CO.

(Circuit Court of Appeals, Sixth Circuit. August 2, 1909. 172 F. R. p. 393.)

1. PATENTS—SCOPE—"PIONEER PATENTS."

A pioneer patent is one which first discloses means to accomplish a certain result, and the term does not apply to a patent for new means to accomplish a result already attained in another way, although they may be an improvement on the old way.

2. PATENTS — VALIDITY AND INFRINGEMENT — DUMP CARS.

The Caswell reissue patent, No. 12,447 (original No. 806,394), for an improvement in cars, consisting of trapdoors in the bottom of the car which may be opened to dump its load, claims 31, 32, 44, 48, 58, 59, 60, 61, 62, and 63, which relate only to the doors, and means for operating them, disclose invention, but not of a primary character, and are not infringed by a device which does not contain the longitudinal shaft operated by means of cogged pinions and plates to open and close the doors, which is an essential feature of each claim, nor any equivalent therefor having substantially the same mode of operation.

HOLT MFG. CO. v. BEST MFG CO.

(Circuit Court of Appeals, Ninth Circuit, August 2, 1909. 172 F. R. p. 409.)

1. PATENTS-INFRINGEMENT-ACTION AT LAW —EVIDENCE.

Where the question of invention is left to the jury in an action for infringement of a patent, no evidence tending to show the true state of the art at the date of the claimed invention should be excluded.

2. PATENTS—SCOPE OF INVENTION — COMBINED STEAM HARVESTER AND THRASHER.

The Best patent 410,306, for a combined steam harvester and thrasher, is for a claimed combination of elements all of which were old; the chief feature of novelty claimed for the combination being the operation of the cutting and thrashing machinery by means of a supplementary engine mounted upon the thrasher frame, to which steam is supplied from the boiler of the traction engine by means of a flexible pipe. Such supplementary engines had previously been used for the same purpose on similar machines driven by horse power. Held, that such patent was not a pioneer patent, but an improvement patent only, and that it was error in an action for its infringement to refuse to so instruct the jury, and to submit the question to them for decision.

WARREN BROS. CO. v. CITY OF MONTGOMERY et al.

(Circuit Court, M. D. Alabama, N. D. Aug. 1, 1909. 172 F R. p. 415.)

1. PATENTS — SUIT FOR INFRINGEMENT — EFFECT OF PRIOR DECISIONS.

On an application for a preliminary injunction to restrain infringement of a patent, a decision of a superior or a co-ordinate court of another territorial jurisdiction sustaining the validity of the patent on a final hearing, in the absence of contrary decisions, will be treated as almost conclusive, and will be followed, unless new evidence of a decisive character is presented.

2. ABATEMENT AND REVIVAL—SUITS FOR INFRINGEMENT — PENDENCY OF PRIOR SUIT.

The pendency of a suit for infringement of a patent in one district does not preclude the complainant from instituting a suit in another district against the same defendant and another, not a party to the first suit, to enjoin an infringement therein; but in the latter suit the court will only consider and adjudicate upon alleged infringements within its own district.

3. PATENTS — SUITS FOR INFRINGEMENT— EQUITY JURISDICTION.

The fact that the owner of a patent has established a royalty for its use by licensees does not deprive a court of equity of jurisdiction to enjoin its infringement.

4. PATENTS—VALIDITY—INFRINGEMENT —STREET PAVEMENT.

The Warren patent, No. 727,505, for an improvement in street pavements, held valid, on a motion for preliminary injunction to restrain threatened infringement, and an injunction granted, subject to the right accorded defendants to prevent its issuance by giving bond.

HERZOG et al. v. NEW YORK TELEPHONE CO.

(Circuit Court, S. D. New York. Feb. 12, 1909. 172 F. R. p. 425.)

1. PATENTS-CONSTRUCTION-SPECIFICATIONS AND DRAWINGS.

While the invention of a patent must be measured by the claims, yet they cannot be considered to the exclusion of the specifications, but claims, specifications, and drawings showing the particular apparatus must be considered together, and must point out the principle by which the invention is practically operated, and, to make out a case of infringement, the apparatus of the defendant must embody such principle of operation.

2. PATENTS — INFRINGEMENT — ELECTRIC SIGNALING APPARATUS.

The Herzog patent, No. 628,464, for an electric signaling apparatus and circuit, used principally to enable guests in hotels by means of latent signal transmitters in the rooms to signal the office, is valid, but embodies a system of bi-directional signaling to a limited extent only, it being possible to signal from the office to a room only when the transmitter in the room is set for a signal to the office, and is not infringed by the system of bi-directional signaling in use in a telephone exchange.

INTERNATIONAL HARVESTER CO. v. RICHARDSON MFG. CO.

(Circuit Court, D. Massachusetts. Aug. 19, 1909. 172 F. R. p. 437.)

PATENTS—INFRINGEMENT—MANURE SPREADER.

The Kemp patent, No. 632,124, for an improvement in manure spreaders, consisting of a tailboard placed immediately in front of the beater to prevent it from becoming clogged in loading, means for raising and lowering the same, and a stop device to prevent the wagon bottom and beater from being operated until the tailboard is raised, discloses invention in such means of operation and stop device, but is limited by the prior art to the precise construction shown, with a narrow range of equivalents. As so narrowly construed, it is not infringed by the device of the Brown patents, Nos. 631,539 and 821,779.

FOWLER & WOLFE MFG. CO. v. NATIONAL RADIATOR CO.

(Circuit Court of Appeals, Third Circuit, July 1, 1909. 172 F. R. p. 661.)

1. PATENTS— CONSTRUCTION — REFERENCE TO SPECIFICATION.

Where the terms are not technical, terms of the art are not used in the claims of a patent to differentiate between different tubes in the patented structure, and the specification may be referred to for the purpose of ascertaining their meaning as so used.

2. PATENTS — INFRINGEMENT— RADIATORS.

The Fowler patent, No. 609,800, for a radiator, narrowly construed as required by the prior art, held not infringed.

HARTFORD et al. v. WESTEN MFG. CO. et al.

(Circuit Court, D. New Jersey. Sep. 4, 1909. 172 F. R. p. 676.)

1. PATENTS — SUIT FOR INFRINGEMENT— PRELIMINARY INJUNCTION

A motion for a preliminary injunction to restrain infringement of a patent is addressed to the sound discretion of the court, and, to justify the granting of such an injunction, complainant's case must exhibit a right, free from doubt or reasonable dispute, by showing either, first, a prior adjudication sustaining the patent after a bona fide and vigorous contest, or, second, a continuous public acquiescence of such character as to be the equivalent of an adjudication, or, third, by clear and satisfactory evidence that the patent is valid.

2. PATENTS — INFRINGEMENT — RETARDING MEANS FOR SPRING VEHICLES.

A motion for preliminary injunction to restrain infringement of the Truffault reissue patent, No. 12,437 (original No. 695,508), for a frictional retarding means for spring vehicles, denied.

CAPEWELL HORSE NAIL CO. v. MOONEY.

(Circuit Court of Appeals, Second Circuit, Aug. 20, 1909. 172 F. R. p. 826.)

1. TRADE-MARKS AND TRADE-NAMES-REGISTRATION OF MARK-COMMON LAW TRADE-MARK.

In a suit for infringement of a trade-mark, objection to the validity of complainant's registration of the mark was not material where complainant had a common-law trade-mark on the device alleged to have been infringed.

2. TRADE-MARKS AND TRADE-NAMES—INFRINGEMENT—UNFAIR COMPETITION.

Infringement of complainant's trade-mark on horseshoe nails to simulate complainant's nails, and produce confusion in the minds of dealers and users, was unfair competition.

3. COURTS—JURISDICTION — INFRINGEMENT OF TRADE-MARK.

A bill may be maintained in the federal Circuit Court to restrain the infringement of a common-law trade-mark, where other jurisdictional facts are present.

4. TRADE-MARKS AND TRADE-NAMES-CHARACTER OF MARKS—ORNAMENTATION.

That a trade-mark, consisting of a check figure formed by intersecting lines impressed on the bevel face beneath the edge of horseshoe nails, was an ornamental device which added to the appearance of the nails, and also came to represent quality, did not prevent it from operating as a valid trade-mark.

5. TRADE-MARKS AND TRADE-NAMES — INFRINGEMEET--NECESSITY-HORSE NAILS.

It was no defense to a suit to restrain the infringement of plaintiff's trade-mark, consisting of a check figure formed of intersecting lines impressed on the bevel face beneath the heads of horseshoe nails, that such mark was produced while the nail was passing through one of the rolls of the manufacturing machinery by which the nail was gripped and held in place; it not appearing that the pattern of the gripping surface of the roll was required to be the same as the trade-mark stamped on complainants' nails, in order to their successful manufacture.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Edwin J. Herchert, Hartford, South Dakota. Chain.—This invention has particular reference to sprocket chains, and is a novel, simple, cheap and effective structure, readily manufactured and assembled, each link of the chain being formed of a single piece and comprising a transversely disposed end sleeve, integral bendable arms carried by the sleeve, one of said arms being provided with an opening, and an integral pivot carried by the other arm and having its free end secured in the opening. In practice the pivot of one link is engaged in the sleeve of the adjacent link.

Charles W. Roberts, Hannibal, Missouri. Marking Tool for Boots and Shoes.—This invention relates to a rotating tool for impressing a bead pattern upon the soles of shoes. The object of the invention is to provide a tool for this purpose which is mounted on a shaft whereby the shoe may be held against the tool in place of the tool being held against the shoe, as was formerly the case, frictional means being provided for heating the tool, said frictional means permitting of the tool becoming sufficiently heated to impress the pattern, but preventing all chance of the tool becoming overheated.

John D. Ball, Schenectady, N. Y., inventor: David Norstedt, Chicago, Illinois, assignee of one-half interest. Skirt Gage.—This invention relates to that class of devices designed to be used by dressmakers, whereby the length of the skirt may be regulated and marked. The principal object of the invention is to provide a gage whereby the edge of the skirt may be turned over to form a level hem at any required distance from the floor, the curved gage bar over which the hem is turned being adapted to be slipped out of the hem as soon as the same is completed.

Newton Campbell, Elizabethtown, Ohio, inventor: Harry J. Sykes and Joseph W. Hayes, Elizabethtown, Ohio, and George H. Wilson, Cleves, Ohio, assignees of one-fourth interest each. Traction Wheel.—This invention relates to wheels for automobiles or other road vehicles, and the object is to provide a simple and practical structure, which will prevent slipping and skidding of the wheels, the invention being designed to take the place of the expensive rubber-tired wheels now in general use. It consists of a wheel rim having a central annular ring or web, and a pair of spaced concentrically-arranged flanges, and a plurality of radially-disposed surface-engaging members or calks extending through the said flanges, said surface-engaging members being provided with springs for yieldingly holding them in their projected relation.

Ernest E. Brott, Burlington, Kans. Rain Water Cut-Off.—This invention relates to that class of devices designed to automatically direct rain water through one outflow pipe or another. The object is to provide a cut-off by which the first flow of water from a roof may be directed down a waste pipe, thereby carrying off accumulations of dust and dirt which may be lying on the roof, and second, to direct the rain-water—now running clean—into a cistern or water receptacle, this operation being entirely automatic and not requiring the attention of anyone.

Alexander J. Innes, Sutherland, Iowa. Table Leg Fastener. — The principal object of this invention is to provide a table having removable legs, with means for securing the leg to the top, so that the leg is thoroughly braced, and side strain instead of a direct pull is applied to the fastening means. This result is achieved by constructing the table-top with a bridge piece secured to the side rails and spaced from the top, said top having a socket member in spaced relation to the bridge piece, and a table leg passing through the bridge piece and screwed into the socket of the member.

Alexander J. Innes, Sutherland, Iowa. Machine for Making Concrete Wall.—This invention is one that possesses material novelty, the object being to provide a moulding machine adapted to enable a hollow concrete wall to be easily, rapidly and economically erected. The machine is entirely automatic, and receives the concrete or other plastic material from an elevator, carries the material to, and distributes it along, a wall under construction, and simultaneously levels, packs and smooths the material, whereby the wall is automatically built up by the machine. The invention has been thoroughly tested in practical use and found to be entirely efficient for the purposes stated.

James F. Myser, Rifle, Colorado. Fibre Fruit Box.—Because of the increased cost of lumber, the cost of wooden boxes, even those constructed of veneer, is rapidly increasing to a point that apparently will soon prohibit their use for the cheaper classes of commodities. The principal object of the invention is to provide a novel, simple and effective box, crate or receptacle that can be constructed of fibre or straw-board, or other analogous material, which can be cheaply manufactured and can be knocked down and set up, and when in a knocked-down position, the parts will occupy but very little space. The invention comprises two duplicate blanks. each blank consisting of an end wall, spaced side walls carried by certain of the edges of the end walls, and spaced flaps carried by other edges of said end walls, the free ends of the side wall of one blank detachably interlocking with the flaps of the other blank, and vice versa.

Ida A. Myser, Rifle, Colorado. Vacuum Fly Trap.—The principal object of the present invention is to provide an apparatus for catching flies and similar insects, of a character that can be placed in private dwellings or public institutions, and constituting means whereby insects can be caught in large numbers and be conveniently disposed of. In a broad sense, the invention is an application of the principle of vacuum cleaning apparatus to produce a novel and effective insect trap, and should meet with the same success that has followed the introduction of the system of vacuum cleaning. The invention consists of a vacuum chamber having means for exhausting the air therefrom, a stationary insect trap comprising an outer casing and an inner cage removably mounted in the casing, a conduit pipe connecting the vacuum chamber to the casing, said pipe communicating with said casing outside of the cage, and a flexible conduit communicating with the interior of the cage and having an open inlet end movable to different positions with respect to the trap.

Allen L. Myers, Lincoln, Nebraska. Two patents.—The first invention relates to a guage adapted to be used for marking the seats for the reception of butt hinges, but is not necessarily limited to this use, as it may be employed in scribing for various purposes. One of the principal objects of the invention is to provide a simple structure in the form of a combination tool wherein the chisel ordinarily employed for cutting the hinge seats constitutes the support for a novel guage that is adjustable for use on different kinds of work.

The second invention relates to an edge turning tool for scraper blades. In tools employed for scraping floors, veneer, and other material, the scraping edge of the blade must be turned or bent at a particular angle when the blade is secured in place in the scraper body. This has heretofore been done by hand, and it requires long practice and efficiency to accomplish the work properly; moreover an expert workman will not, on an average, turn the edge correctly more than seven times out of ten. The object of the present invention is to provide means whereby the scraping edge of the scraper blade may be quickly and properly turned without the necessity for the high degree of skill heretofore essential. The invention may be made as part of the scraper, or separate therefrom, or in the form of an attachment capable of application to practically any of the well known scrapers now on the market.

James F. Myser & Albert Zieseniss, Rifle, Colorado. Eaves Trough.—The object of the present invention is to provide a simple, inexpensive and efficient device which will possess great strength and durability, which will prevent accumulations of ice within it, and having means by which the eaves trough may be kept heated throughout its entire extent by the hot air or steam employed for heating buildings, whereby the water is prevented from freezing within the eaves trough, causing a stoppage of the trough and the consequent overflowing of the same. To this end, the invention consists in providing a heating chamber around the lower part of the trough and connecting with the heating chamber the heating pipe or conduit.

Jacob O. Kvenvold, Hartland, Minn. Horse Shoe Calk.—The object of this invention is to provide a calk which is simple and cheap in construction, will remain sharp until it is entirely worn out, and when applied to the shoe gives a better purchase and has better holding qualities to prevent slipping than those now generally known to the art. To this end, the invention consist of a tapered body, one side of which is steel, the opposite side being iron, and an angular holding spur projecting from the base of the calk and from the steel side thereof, the outer face of said spur being of steel and arranged in substantially the same plane as the outer steel face of the calk.

M. L. Stewart, El Paso, Tex., and F. A. Carr, Topeka, Kans. Lubricating Packing.—The object of the invention is to provide by a novel and simple method, an effective packing that will withstand high pressure and constant service, and will constitute an excellent lubricant for the rod or other packing device that moves through or past it. To this end the invention consists in thoroughly mixing together, while in a molten state, lead, tin and antimony, then casting the composition, then granulating the same when hardened by a cutting tool, mixing graphite with the particles of the granulated composition, placing the composition in a porous casing, and soaking the whole, after being encased, in a lubricating oil.

James D. Martin, Oskaloosa, Iowa, inventor; Samuel M. Robertson, same place, assignee of one-half interest. Hydrant.—The particular object of the invention is to provide means whereby when the valve of the hydrant is closed against its seat to stop the flow of water through the lower portion of the stand-pipe, an outlet opening is left unobstructed above the valve, so as to permit any water in the upper portion of the hydrant to flow out therefrom and thus prevent the freezing of the hydrant. The invention also presents a hydrant with a handle, which in one position locks the valve to its seat, thus preventing accidental displacement. It also has a peculiar form of valve which properly engages with the seat, but will not flatten out under pressure.

Stephen D. Smith, Atlanta, Ga. Household Utensil. — The principal object of the invention is to provide a novel structure which can be cheaply manufactured, and can be employed for a variety of purposes, such as cooking food, canning and preserving, sterilizing, obtaining the essential and volatile oils of fruit and other substances, distilling water and producing vapor for baths and the like, these results being achieved by the production of an apparatus so inexpensive and simple as to be within the range of every household, and capable of being operated by a person of little experience.

Theodore Kardong, Minneapolis, Minn. Metal Bending Machine.—This invention relates to a means for bending metallic bars, rods or the like, and its object is to provide simple mechanism of a powerful nature, whereby articles can be readily formed into various shapes, the machine being reversible so that different bends can be made without the necessity of reversing the article being operated upon, and means being provided whereby the shapes can be accurately determined.

Thor Rustad, Erskine, Minn., inventor; Andrew P. Vollom, Minneapolis, Minn., assignee of one-half interest. Land Clearing Machine.—The primary object of the invention is to provide a machine for clearing land from stumps even with the surface of the ground, thus eliminating obstructions to the use of harvesters, so that grain may be raised on new land. The machine can be propelled from point to point, and is provided with a saw which is movable to a variety of positions in order that stumps of various shapes and in different places may be reached and cut.

James A. McClellan, Menomonie, Wisc. Hame Connection.—This invention relates to an improved, detachable connection between a hame and trace, and the object of the invention is to provide a connection of malleable iron or steel, applicable to light harness, which can be easily repaired by any one without having to remove the draft-eye member of the hame. The invention consists of a two-part hame connection which comprises a fixed member secured permanently to the hame and having a removable member adapted to receive the wear produced by the trace-eye or clip, so that when the said removable member is worn out, a new one can be readily substituted and thereby the loss of the entire hame connection, as has heretofore been necessary, can be avoided.

NEW PATENTS FOR SALE.

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FOR SALE — U. S. Patent No. 958,672, and Canadian Patent 126,790, on Self-Waiting Tables. Address, Karl J. Olson, P. O, B. 392, Gladstone, Michigan. dec

FOR SALE—Patent No. 957,561, dated May 10, 1910. Quilting Frame. Something every family needs. The handiest frame ever made. Will give a good commission if sold soon. If interested write me. Fred Jakob, Bartley, Nebr.

FOR SALE — U. S. Patent No. 647,865, and Canadian Patent No. 127,371, on a Door Catch. Either outright or on royalty. Address, William D. Taubert, Hills, Minn., care Alfred Nuffer. dec

FOR SALE—Patent No. 959,481, dated May 31, 1910. Automatic Rivet on Scissors. Cuts clean, saves worry and time for women. Part cash and royalty. Address, John W. Dowden, Box 122, Reeves, La. dec

FOR SALE—Patent No, 931,287. Permutation, Keyless Lock. May be used on trunks or suit cases; cannot be picked; no danger of losing key; profitable invention if properly handled. No reasonable offer refused. Address, Wm. Erhardt, 112 Munson Street, Astoria, Long Island, New York. dec

FOR SALE — U. S. Patent No. 939,727 and Canadian Patent No. 155,875. Snap Hook. Automatic adjustment and easy operation; capable of various uses and is self-locking. Will sell outright, or for any state or county. Address, Matti Maki, Grelland, North Dakota. dec

FOR SALE or on royalty—U. S. Patent No. 961,174, dated June 14, 1910. Micro-adjustable foot-arch support. Worn in insole. For weakened or flat feet. Wearer can raise or lower by turning a screw. Supports either inner or outer arcb of foot as comfort suggests. Result of eight years professional study and experimenting. Splendid article for growing, mail order business. A. M. Smith, D. O., Hagerstown, Md.

FOR SALE or on royalty—U. S. Patent No. 962,048. Potato Grader. Will sort potatoes into three different sizes free from dirt. Great labor-saving invention for either farmer or dealer. Address, Hans Peterson, Mora, Minn. dec

FOR SALE—Patent No. 909,299, patented Feb. 15, 1010, Self-registering car step. Also combined station and street indicator and fare register for street cars—patent pending. For full particulars address, Frederick Langharst, R. D. No. 33, Evans City, Pa. nov

FOR SALE—The Canadian patent for fluid motive power pumps. Macbine can be made at a small cost. Will do more work than a ram, and also perform work tbat a ram cannot do. Address, H. T. Farnswortb, 1018 Monroe Street, Lynchburg, Va. nov

FOR SALE—U. S. Patent No. 950,350. A traveling scaffold for repairing telegraph or telephone wires or trimming trees along lines of wires. Easily constructed. Requires no special machinery to manufacture. One in use gives perfect satisfaction. Address, T. H. Schlarmann, Breese, Ill. nov

FOR SALE—Patent No. 959,309. Car Fender. Can be manufactured cheaply. Will sell outright or on a royalty basis. Cheap for quick sale. Address, A. H. Carter, 2235 Cutter Ave., Canton, Ohio. nov

FOR SALE—Patent right on a three-wheel roller skate. A splendid invention. Apply to H. P. Addison and Co., 115 Dearborn St,, Chicago, Ill. nov

FOR SALE — Patent No. 956,542, dated May 3. 1910. Peterson's Automatic Damper Control, Simple, durable, reliable and practical. Something needed in every home, store, factory and public building. Will sell outrigbt. or will consider a reasonable royalty proposition. Address, Hjalmar Peterson, Falun, Wisconsin. oct

FOR SALE—Patent No. 891,082. Folding Box or Crate. Something new and adapted for shipping fruits, farm and poultry products. Easily adjusted, and wben folded occupies a comparatively small space. Can be constructed very light, but method of construction makes it very durable, and it is also provided with means for sealing. If interested address, J. A. Lamp, No. 1109 N. Evans Ave., McKeesport, Pa. oct

FOR SALE—U. S. Patent No. 950,302. and Canadian Patent No. 120,052. Bottle Washing Machine. This machine wasbes and fills 576 bottles in 15 minutes. For copy and particulars, write to Ronald J. Pfeifer, Box 53, R. F. D. No. 1, Callicoon, N. Y. oct

FOR SALE—Patents No. 917,525 and No. 856,018, offered for sale for tbe sum of $2000. For further particulars inquire of R. Belden, Belden, Cal. nov

FOR SALE—U. S. Patent 952,792. dated March 22, 1909. Combination straigbt edge sbingling and clapboard gage. Address, C. H. Webster, Thomaston, Maine. nov

FOR SALE—Patent No. 958,461, for quick detachable wagon skates. Sets made to sell for ten dollars witb big profits. Absolute necessity. Make a sleigh of any wagon in ten minutes. For particulars write, Max Aubertel. Cornwall-on-Hudson, N. Y. nov

FOR SALE—U. S. Patent No. 957,308, issued May 10, 1910. Wagon-jack. Can be manufactured at small cost. I wish to sell outrigbt for cash. For particulars write, M. G. Colby, Main St. Sta., Franklin, N. H. nov

FOR SALE—Patent No. 958,915, dated May 24. 1910. Hopper closet grappling hook for plumbers' use. For removing stoppage to hopper closets, sewer traps, etc. Easily manufactured; quick sales. Address, E. C. Fraw, Jefferson, Ohio. nov

FOR SALE—U. S. and Canadian patents Nos. 948,849 and 126,016, respectively, dated Feb. 8, 1910 and May 31, 1910, A practical jamb adjuster. Just the thing for contractors and carpenters. Outrigbt sale or on royalty. Greatest time saver. Address, Christian Ehr, Portage, Wisconsin. nov

FOR SALE—Patent No. 910,785. dated Jan. 26, 1909. The ultimate universal detachable sanitary soap dish. Holds soap firmly when throwing water out. A boon to all homes, camping and outing parties. Can be manufactured at small cost. Apply to T. C. Colton, Griswold, Man., Canada. oct

FOR SALE on royalty—U. S. Patent No 949,694. Brush Cleaner for Carpet Sweepers. Address, Armor & Collner, St. Petersburg, Pa. oct

FOR SALE — Patent No. 900,737, dated Oct. 13, 1908. Novel and practicable hank for use on double and single stays of the largest ships or smallest yachts. Address patentee and owner. Samuel A. Jackson, Box 26, Kittery, Maine. oct

FOR SALE or royalty—Patent No. 955,210, an attachment that converts any walking turning plow into the best sulky plow made. Can be manufactured cbeap and sells at a big profit. Address, L. H. Rucb, R. D. No. 3, Wincbester, Tenn. oct

FOR SALE—U. S. Patent No. 958,546, issued May 10, 1910. Railway Spike. Impossible to work loose of itself. Impossible for rails to spread. Any reasonable offer considered. Address, R. A. Rossmeisl, Wbitingham, Vermont. oct

FOR SALE or exchange for real estate—U. S. Patent No. 950,630, dated March 1, 1910; Canadian Patent June 6, 1910. Trolley Poles. Can't come off wire. Very good invention. For particulars and price address, Henry Brod, St. Cbarles, Mo. oct

FOR SALE—My invention will heat and light the world and run all steam and electrical railroads and tbe only expense is the plant run by gravity air pressure. For particulars address, Phillipp Staucb, 106 East Illinois St., Chicago, Illinois. oct

FOR SALE — Patent No. 951,920. Adjustable sawing machine. for sawing perfect circles. Can be manufactured at small cost. Will sell outright or part cash and royalty. Address, Doc H. Smith, Moundridge, Kansas. oct

FOR SALE or lease on royalty—Patents on can holders and cap wrench. The best in the world without exception. Will send samples to any interested parties. Canadian patent issued Nov. 30, 1909; U. S. patent issued March 8, 1910. Would like prices on manufacturing. Address, Elias Smith, Box 50, Skinners Eddy, Pa. oct

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WANTED—to correspond with patent owner or manufacturers of articles suitable for growing mail order business. Address, W. U. Ramershofen, Muirhead Building, San Francisco, Cal. oct

WANTED—Help to organize and promote a company to establish small mills in timber sections to manufacture material for my patented Veneer Barrels. Have an export and domestic trade using 800,000 barrels annually. Address, George H. Brown, 295 Duke St, Norfolk, Va. jan

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WASHINGTON, D. C., OCTOBER 1, 1910.

Attorneys in Trouble.

Washington patent circles have been stirred during the past summer by the proceedings which were taken by the local Patent Law Association against two of its members, constituting the new firm of Greeley and McIntyre, both of whom have in the past taken an active part in the administration of the affairs of the Association.

The Patent Law Association is a voluntary unincorporated body composed of patent lawyers, solicitors and experts. The membership consists of 187 persons, eighty-seven of whom are residents of the District of Columbia. Considering the large number of patent attorneys throughout the country, and the relatively small proportion living in Washington, the Patent Law Association represents but a small fraction of those practicing before the Patent Office. It is nevertheless an influential body.

The Association occupies offices in the Washington Loan and Trust Building, at the corner of 9th and F Streets. Its offices are equipped with a library and stenographers and typewriters, and the rooms are conveniently available for use by its members for the taking of testimony in cases in which they are engaged as counsel, and also for meeting with their associates and with adverse counsel.

The articles of the association which it is claimed Messrs Greeley and McIntyre violated in their practice and advertising, are as follows:

"All advertising by members of the Association must be of a dignified character and with strict regard for true professional ethics.

"Advertising designed to create, directly or indirectly, false or misleading impressions in the minds of the readers; to discredit the work of brother attorneys; to offer advice before it is asked; to give any service for nothing for the purpose of securing a client; to offer services on a contingent basis; to stimulate the uninformed to develop and patent inventions for the purpose of supplying a supposed public demand therefor, and all kindred advertising shall be regarded as unprofessional, and anyone guilty of such advertising shall be disqualified for membership in this Association. Any member duly found guilty of advertising of such objectionable character shall be dropped from the rolls of the Association."

"Professional association by a member of the Association with any disbarred or discredited attorney in such a way as in any manner to avoid, relieve or abate the effect of his disbarment, or confer upon such disbarred or discredited attorney, any benefits or emoluments, derived from said professional association, is incompatible with the best interests of the Association and repugnant to the Rules governing qualification for membership therein, and may be considered an offense justifying expulsion."

On March 8, 1910, the Board of Managers held a meeting at which charges against Greeley and McIntyre were presented. A committee of three persons was appointed to investigate the firm. The committee completed its investigation and reported to the Board, presenting certain letters and other documents in substantiation of the charges. It was decided that they constituted prima facie evidence of violation of Articles G and H of the provisions of the Association above quoted, and the Board issued the following order, and served the same on Greeley and McIntyre:

"The Board of Managers, therefore, hereby prefers charges of violation of both of the quoted provisions against you, and appoints Wednesday, the 15th day of June, 1910, at 4.00 o'clock P. M., to hear you personally or by attorney, in response to those charges with a view to enabling you to show, if possible, that the charges were not well founded, and that your relations with John Wedderburn, and your advertising matter are not such as do, within the letter and meaning of said provisions of the Articles of the Association, require the Board of Managers to recommend that you be expelled from the Association and dropped from its rolls."

On June 14 one of the members of the firm replied, declining to avail himself of the opportunity to appear before the Board on the ground that they had already decided against him; and the Board at a meeting the next day, found that Messrs Greeley and McIntyre, under the designation of Greeley and McIntyre, were guilty of the charges, and recommended that they be expelled from the Association, and their names dropped from the rolls. On June 17, the Board called a special meeting of the Association to act upon the charges, and also the report of the committee and their recommendation in the matter; but on the same day one of the members of the firm sent a protest against the action of the Board, together with a written demand for an immediate withdrawal by notice to all members of the Association of so much of the call for the special meeting aforesaid as related to the alleged charges against him. The Patent Law Association, through its secretary, refused to modify the notice; and one of the members of the firm sought by a bill in equity in the courts of the District of Columbia to enjoin the Association from having the meeting, or acting upon the charges which had been brought. A preliminary restraining order was issued, but afterwards dissolved. Later, on August 2, both members of the firm resigned from membership in the Association.

The burden of the complaint against the firm was their method of advertising, and their association with one John Wedderburn, who was disbarred from practice before the Patent Office in 1897. The Patent Law Association, in its answer to the bill of complaint filed in the court, called attention to the fact that it was Mr. Greeley, himself, when acting as Assistant Commissioner of Patents, who made the following report to his superior officer, Commissioner Butterworth, as to the conclusions he had drawn from the hearing on the question of the disbarment of Wedderburn:

"In conclusion I deem it my duty to call your attention to the fact that the respondents in the conduct of their business as carried on by them, and in the execution of their dishonest and fraudulent schemes, had the cooperation and assistance of certain persons, as the responsible heads of the various departments of their office, who were prior to their employment by the respondents, in practice before this Office, some of whom may attempt to resume practice and some of whom have in fact applied for registration under the present Rules of Practice. I cannot but be of the opinion that such persons, who, having had experience in practice, must be presumed to be aware of what honest and honorable methods of practice are, were willing to aid and abet the respondents in their peculiar practices, and continued to do so after the attention of the public had been called to these practices by the institution of proceedings against these respondents, must be held to be sharers in the guilt of the respondents and unfit to be permitted to practice before this Office. In my judgment, none of these persons should be admitted to practice or permitted to be registered, except upon clear and convincing proof that they had no part in, and were in no sense responsible for, any of the fraudulent and deceptive schemes of the respondent."

It is not generally known that there is a written regulation of the Department of the Interior which supports the action of the Patent Law Association, and which it would seem would place Greeley and McIntyre in jeopardy, if the facts concerning their association with John Wedderburn should prove to be true. It is the following:

"If any attorney or agent in good standing before the Department shall knowingly employ as sub-agent or correspondent a person who has been prohibited from practice before the Department, it will be sufficient reason for the disbarment of the former from practice."

That there was some association or connection between John Wedderburn and the firm of Greeley and McIntyre cannot be disputed; but to what extent, if any, the said Wedderburn controls the management of the business of the firm, is, as yet, undetermined. That he has charge of the advertising branch is conceded, and this is about all of the business that Wedderburn is competent to handle, for he is not a patent lawyer in any sense of the word. At present he is engaged in the sale of liquor, and has been so engaged for the last five years. Wedderburn tried to have the order of disbarment cancelled in 1907, but his request was refused by the Patent Office. A significant fact in this connection is that Greeley and McIntyre appeared before the Commissioner of Patents at that time, to urge the claims of Wedderburn. While the resignation of Greeley and McIntyre stopped further proceedings by the Patent Law Association, there is a hint that some other action is likely to be taken, and this time by the Patent Office.

The Giant's Eye.

Under this name, an interesting and useful instrument has been introduced in Paris. It is a walking stick with optical devices which enable a person to see over crowds, the hats of ladies, fences, walls, etc., that hinder the outlook. The stick is a hollow tube, near the top of which one half of a field glass is to be screwed on. Near the lower end is a hole fitted for the eye. The rays of light pass through the lens of the field glass, and strike the prism inside the stick. Here they are reflected at right angles to another prism opposite the eyehole, where they are again reflected and enter the eye, showing clearly the objects to be viewed. A camera may be attached to the field glass and pictures taken of objects not otherwise visible. Baseball managers will now have to devise some new method beside the high board fence to shutoff deadheads.

Peppermint Farms.

It is not generally known that America supplies the world with peppermint, as well as with other articles and products too numerous to mention. The industry has grown to such a degree that regular plantations have been established for the growth of the odorous herb. The largest of these are in Michigan, and over 100,000 pounds of peppermint oil, worth $5 a pound, are produced annually from the moist and black soil of that state. Peppermint farming is simple. The roots are planted in the spring; the bushes, which grow about 3 feet high, are cut down in the late summer; the stilling goes on through August and September. An acre yields about 25 pounds of oil. The cost of production—planting, cultivating, expressing the oil—is about $15. The oil itself brings $125. Thus every acre of a peppermint farm gives a profit of $110.

Electricity Restores Life.

Will the electric current that kills a man also restore him to life? Experiments which seem to demonstrate this have been recently carried out in New York in the presence of a number of physicians and scientists, when a rabbit was electrocuted by a strong current and then by the same medium brought back to life.

Contacts were first made at the head, heart and base of the spine of the rabbit. The current was then turned on, and at the end of one minute doctors examined the animal and declared that all heart and respiratory action had ceased. Then the resuscitation apparatus was applied. The current was turned on sharply and then turned off again, and after a while the muscles of the heart and lungs began to respond. A few minutes later the breathing and heart beats were normal, and in half an hour Bunny was himself again, none the worse for wear. If this can be done with a rabbit, the experimenters ask, why not with a human being? It is not likely that anyone will lend himself to the experiment, and it would hardly do for the bodies of criminals who have met death in this manner to be subjected to the test: but there are many cases in which workmen are accidentally killed by coming in contact with live wires, and these would offer an advantageous field for trial.

Laying Cable Lines.

Cable lines look straight enough as seen on the maps, but they are anything but straight as they lie on the ocean floor. Before an ocean cable is laid, a vessel is always sent out to make a careful survey of the proposed route. The route is picked for these cable lines, just as railroad engineers run lines of levels before they finally locate railroad routes. With piano wire for sounding lines, the cable engineer determines the levels of the ocean floor and secures samples of the bottom so that he may decide where it is best to lay the cable.

The great Pacific cable, 8,000 miles long, between Vancouver and New Zealand, was time and again deflected from a straight line between the island stations at which it touched in order to avoid towering submarine mountains, or craters, or ground that was hard and undesirable as a resting place for the cable. The samples of ground which cable engineers most desire to bring up from the bottom are the soft oozes, or muds that are found only in the deep seas far from the continents and which are composed largely of the pulverized skeletons of marine animals. Cables last longest when they repose in these soft beds. They are not found everywhere in the deep ocean, but if they are not too far away the cable route is deflected to cross them.

A great deal that has been learned of the ocean floor in recent years has been incidental to the laying of cables. When the United States steamer Nero was sent to pick a route for a cable across the Pacific, she found a depth of 5,269 fathoms, or six miles, the greatest depth in the ocean of which we have any knowledge. Interesting discoveries, of value to geologists, were made about the ocean floor between Celebes and Guam, when the former island was connected with Borneo and with our own small island possession far to the north.

Thousands of miles of cable are laid at depths of three to four miles below the surface, and because at such depths the pressure of the water is about four tons to the square inch, the cable sinks very slowly to its resting place. The line paid out over the stern of the vessel drops instantly out of sight, but the vessel is often twenty miles away before the cable finally rests on the bottom. At these great depths the water is very cold. The many hundreds of soundings taken during the cable surveys have established the fact that there is very little difference between temperatures of the deepest parts of the oceans. Their waters are uniformly only a few degrees above the freezing point. It is found also that the bottom of the deep parts of the sea is more favorable for the longevity of cable lines than the harder ground of the shallower waters nearer the coasts. This is fortunate, for it is less expensive to haul up and repair a cable that needs to be raised only from comparatively shallow waters.

Hydrogen Motor.

The science of power production will be radically changed, if the expectations of the inventor of a new motor are realized. The process is nothing less than the manufacture of fuel out of water. Power has long been secured from water by the old fashioned gravity wheel, and more recently, by the utilization of the turbine. We also turn it into steam and transform it into electricity. But the new motor involves a different idea. Captain Edward C. Warren, master mariner and engineer, separates the chemical constituents of water, so as to take advantage of the explosive capacity of these elements in recombining to produce power. The product of recombination is water which of course may be used over and over as many times as extraneous forces are applied to decompose or separate it into its elements.

That hydrogen may be manufactured into water by more or less complex and expensive methods, is well known. The constituent elements of water are combustible when isolated. The only problem is to isolate them after they have once been combined. This, nature is constantly doing, and men have been trying to accelerate or "short circuit" the process, in order to restore immediately these combustible substances to their original state, and have them ready to reunite in the phenomenon of combustion. The secret of the production of hydrogen for fuel lies in the successful manipulation of that force in nature called chemical affinity of elements—in other words, the isolation of the hydrogen under certain conditions and its recombination through combustion with the oxygen with which it was originally associated in the form of water. Combustion is simply the manifestation of chemical affinity. When hydrogen and oxygen are brought together under favorable conditions, they unite and take the form of a highly rarefied aqueous vapor, which is immediately condensible into water at ordinary temperatures, and can be readily recovered in a form adapted to our needs. When the water is subjected to conditions which overcome the affinity, the elements are again separated.

In burning coal and generating steam power in an engine, an efficiency of from 5 to 10 per cent is the best that is realized with the most highly developed equipment, and this does not take into account the cost of mining coal or even the prodigious expense of shoveling it into the furnaces—this latter alone, in the case of the Lusitania, amounting to as much as the cost of the coal delivered on board ship. All this, the inventor claims, is eliminated in the new motor, for it manufactures the fuel as it goes along, drawing its supply of raw material without cost from the ocean of water or air in which nature has stored boundless supplies of fuel energy in the form of hydrogen and oxygen, costing nothing but the harnessing to yield us in abundance that mechanical power so essential to human advancement.

The heating value of hydrogen in combination with oxygen is 60,000 heat units per pound. The heating value of the best coal is about 14,000 heat units per pound. A process for the manufacture of hydrogen on a basis that will yield more heat units for a dollar than a dollar will buy in the form of coal, must obviously put an end to the use of coal as fuel, for hydrogen is a perfect fuel. It leaves no ash, makes no smoke or poisonous gas, and being derived from water and made as required, it needs no transportation or handling. With the general adoption of this new power would come the extinction of one of the oldest and greatest of human industries—the mining of coal. The threatened exhaustion of its coal deposits would no longer alarm the world. Speed would also receive a new impulse. A three day ocean boat, going at the rate of 50 miles an hour, is within the possibilities. The fastest ship of the seas today carries 5000 tons of coal in her bunkers, and 15,000 tons of machinery necessary to drive her. All this weight would be done away with. The vessel would have much more cargo room, and would be free from the unpleasant vibration that now characterizes high-speed ships, for the new system does not involve extensive machinery. The air ship, the automobile, the power plants in general would also benefit by the adoption of the new motor. If all these promises are fulfilled, the world will have made the greatest stride in power since Watt discovered the steam engine.

Magnet in Salvage Work.

A powerful electric magnet was recently used with great success in recovering 15,000 kegs of nails which went to the bottom of the Mississippi river. A boatload of these products sunk near New Orleans in about 100 feet of water. It was a menace to navigation, and its cargo was valuable enough to justify attempts to recover it. The water was too deep and the current too swift to allow the diver in armor to work at salvage. So a steamer with a huge magnet was despatched to the scene.

Only one firm in the country—a Milwaukee company—would agree to manufacture a magnet of the required size. It weighed, when built, 3200 pounds, and was guaranteed to pick up 1500 pounds of the sunken steel. Magnets have long been used in iron and steel works, but have been operated in the open air. To work in water the magnet must be absolutely proof against its liquid environment. The magnet built was a large circular plate of steel, 43 inches in diameter and about 19 inches in height. A copper ribbon an inch wide and about one-eight of an inch in diameter was wound round the steel, with insulation between each layer. As many windings as possible were put on, as in the number of the turns of the copper coil lay the efficiency of the magnet after it had been connected with the electric service lines. Not only was this magnet itself protected from water, but the electric lines reaching down with it had to be insulated to the third degree at least, the last covering consisting of the best grade of garden hose.

The barge that had sunk with the nails had its nose in shallow water, but in sinking with its heavy cargo, its length of 200 feet was not only left in the deep water of the channel, but as the stern of the barge broke in two, it allowed much of the heavy cargo to slide from it into deeper water, and where the current was especially heavy.

The first difficulty with the divers came from their fear of the magnet in the water, connected with the 110 voltage current above. But when they were shown that there is a difference between a water tight electrical magnet and an electric wire in the water, they went down and placed the magnet where it would take hardest, strongest hold on the sunken target. The largest pull of the magnet lifted seven hundred pounds, or half a dozen kegs. A feature of the haul was that while the kegs were stripped of wood, they were so magnetized that the nails retained the shape of the keg itself. The sunken cargo was considerably rusted, but appliances were used which brought back the original polished surface without wasting the material. The nails, for instance, were placed in a revolving steel cask, partially filled with sawdust and soda, which restored them to their normal salable state. The test of the magnet was so successful that it will be used again in similar emergencies. No matter how deep the water or how swift the current, the cargo can be raised by this agency.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Battery jars, Machine for and process of forming linings for storage....A. J. Meier
Bearing.....C. L. Fowle
Bearing, Expansible..C. Van Middlesworth
Bell-ringer, Automatic.....C. Aalborg
Belt.....J. W. Foster et al
Berry-box, Folding.....W. W. Wood
Binder.....L. E. Heller
Binder ball-lock, Sectional post.....P. A. Bowen
Binder, Loose-leaf.....W. C. Traher
Binder, Temporary.....J. Patterson
Binders, Perforating attachment for loose-leaf.....J. J. Diehl
Bookbinders' appliance.....G. D. Steere
Boring Machine, Taper.....R. R. Kuss
Boring-tool.....O. B. Elder
Bottle-capping machine...R. W. Wittemann
Bottle-filling machine.....B. Gallagher
Bottle stopper, Non-refillable...W. R. Voss
Box bottoms or lids, Manufacturing.....B. G. Nice et al
Bracket.....F. B. Cook
Braider-spool.....F. Mossberg
Braiding-machine carrier..E. F. Parks et al
Breaking and scrutching machine.....J. W. Poindexter
Brick-handling machine.....R. C. Penfield
Brush, Revolving npholsterer's.....D. R. Johnson
Bncket, Bottom-dumping....G. L. Stuebner
Buffer, Swinging.....A. Christianson
Building-block.....L. Phillips
Burner.....G. J. McPherson
Calculator.....H. L. Lerner
Calendar-rolls, Safety device for.....W. Jameson
Calipers, Micrometer attachment for machinists'.....J. H. Pember
Camera attachment.....C. W. Kaufmann
Can lock, Milk.....D. J. Thayer
Can receptacle, Garbage.....T. P. Bolger
Cans, Spriug attachment for oil.....W. B. King
Caponizing instrument.....C. J. Filling
Car and cart, Dump.....J. B. Shelton
Car, Box.....W. E. Fowler
Car, Concrete.....J. B. Quinn
Car hand-brake, Railway...R. T. Burdette
Car-journal dust-guard.....J. P. Thomas
Car retainer or cbock.....R. M. Lindsay
Car-step, Automatic.....W. M. Hamilton
Car, Tank.....W. M. Krickbaum
Car-ventilator.....F. W. Simsoa
Car-wheel.....W. Conway
Carbureter.....H. A. Miller
Carbureter.....S. P. Sanders
Casing, Protective.....B. Volkmar
Caster-holder.....H. D. Penney
Cattle-guard.....W. E. Dement et al
Celluliod composition.....J. W. Aylsworth
Cellulose structnres, Manufacturing.....R. Linkmeyer
Chain-grate furnace.....A. W. Rennis
Chair fan attachment, Rocking..D. Bilisits
Chair parts, Fastening device for.....M. D. Bell
Chuck, Drill.....E. E. Cogswell
Churn.....W. A. Decker
Cigar-cutter.....E. Walker
Clamping device.....F. Gerth
Closet connection.....F. W. Carlson
Clutch.....H. A. Hancock
Coat-banger.....R. E. Macintosh
Coffin-case, Metallic.....J. H. Schlafly
Coin-controlled apparatus.....I. Robbins
Collapsible tub.....J. D. Green
Collar.....E. J. Quigley
Collars, Reinforcing and supporting device for flexible.....D. Marinsky
Colter-fastening.....J. W. Hiett
Combination-fnrnace.....T. Holland
Compasses.....J. Diracca
Compressor.....H. D. Shelton
Concrete construction.....J. E. Conzelman
Concrete constrnction, Sectional mold for.....F. S. Farrar
Concrete reinforcement.....R. S. Allyn
Concrete, Sheeting-pile of reinforced.....S. L. Ravier
Condenser.....G. M. Harden
Condenser, Steam.....P. H. Sellers
Conduit, Flexible.....G. A. Lutz
Conduits, Elbow for..2 pats....G. A. Lntz
Confections, Storage-receptacle for frozen.....C. W. Reynolds
Controller. Electropnenmatically-operated.....J. Mahoney
Copy-holder.....S. Steinmeyer
Corner-fastening.....R. R. Rockwell
Cornet-monthpiece.....L. E. Taylor
Corset.....J. M. Liebermann
Couch and bed, Combined....D. T. Owen
Couch, Convertible.....J. H. Dyett et al
Coupling device.....J. H. Beltz
Coupling-hook, Anxiliary...D. T. Goodman
Cover fastener, Receptacle...H. Jacobson
Cover, Receptacle.....B. J. Levin
Cradle, Folding.....A. W. H. Raettig
Crank, Adjustable.....T. S. White
Crate, box, &c., Collapsible.....J. A. Coffey et al
Crate rack, Bottle.....M. Robinson et al
Cream-float-locking device.....M. S. Tarkington
Crib strncture....W. M. and J. P. Lawyer
Crushing-roll.....T. A. Edison
Crushing-rolls.....T. A. Edison
Cultivator.....W. F. Nielsen
Cultivator.....J. L. Woolard
Cultivator-shovel.....D. Katt
Cultivator-shovel moldboard.....W. M. Medcalf
Currycomb..2 pats.....A. Rahn
Curtain-fasteuer.....L. C. Bailey
Curtain-pole.....J. Schopen
Curve, Adjustable irregular...A. Gasparich
Cuspidor, Non-spilling.....G. Pastors
Cut-out and metering apparatus, Service.....T. E. Murray
Cycle shock-absorber, Motor..E. Loudenclos
Davenport and bed, Combined.....J. G. Hulse et al
Deflecting-bars, Adjnstable stand for.....E. C. Larry
Desk-pad.....A. Swarin
Diffnsion apparatus.....J. Stewart
Diffnsion process.....J. Stewart
Dish-cleaner.....G. Jaekle
Display-hanger for curtains, &c.....C. E. Perkins
Distillation, Wood.....H. Rasche
Ditching-machine.....S. De Force
Door check and closer.....J. C. Regan
Door-hanger.....A. Wagner
Door-lock.....A. Carpenter
Draft-rigging, Friction.....C. A. Tower
Drawer-guide.....A. Elmborg
Drawing-board attachment..A. H. Maranda
Dredge cutter-head, Hydraulic.....W. T. Weaver
Drill.....L. Waters
Drill-press and boring-machine, Combined.....J. T. Sherod
Drill-spindle driving mechanism..H. Allen
Drilling-machine, Automatic.....F. H. Pierpont
Drying-machine.....A. M. Shreuder
Dust-collector.....W. Gyer
Easel.....W. E. Trum
Easel or the like.....F. J. Kristofek
Egg-tester.....G. Arthur
Electric apparatus, Vapor.....J. T. H. Dempster
Electric circuits, Time-limit protective device for.....H. W. Cheney
Electric-conductor terminal...E. Schneider
Electric furnace for metallurgical purposes.....H. F. D. Schwahn
Electric machine, Dynamo.....M. Walker
Electric switch, Pendent.....F. E. Seeley
Electrical apparatus.....C. Aalborg
Electrical receiving apparatus..J. M. Boyle
Electrical receptacle and rosette.....L. J. Castonguay
Electroplating pipes, &c., Apparatus for.....D. H. Murphy
Elevator.....J. H. Taylor
Engine lnbricating apparatus, Steam.....E. Ryan
Engine starting apparatus, Gasolene.....V. Morrill
Engine wheels, Extensiou-rim for traction.....T. Scheie
Engines, Filter or junk plate for the crank-cases of explosive.....G. W. Marble
Engraving-machine.....R. H. Kirk
Engraving-machine.....H. F. Whedon
Envelop-machine.....M. A. Stewart
Etching printing-plates, Apparatus for.....W. J. Holt
Evaporator-heater.....G. H. Grimm
Explosive liqnids, Draw-off device for.....L. Kessler
Eyeglass-temple.....L. H. Broome
Eyeglasses.....C. Alter
Eyelet and rivet feeding device.....M. A. Stewart
Feed-bag.....A. Kappenberg
Feed regulator, Water..2 pats..W. H. Bice
Feed-trough, Adjustable.....F. C. Griner
Fence construction, Post and wire.....P. F. Frost
Fence-post.....H. S. Perry
Feuce-post.....S. W. Loomis
Fence-Post brace.....W. O. Freeland
Fender.....F. Gautzsch, Jr
Filaments, Apparatus for the continuous manufacture of.....G. Michaud et al
Filing-cabinet.....H. J. Davis
Fire-alarm.....M. V. Crawford
Fire-alarm system.....R. Couture
Fire-cracker holder.....M. Nielsen
Firearm.....T. C. Johnson
Firearm, cleaning-rod.....J. H. Blair
Firearms, Sliding operatiug-handle for.....F. F. Burton
Fishiug-signal.....J. J. Dibbles
Flat-iron, Electrically-heated.....G. E. Stevens
Floor-scraper.....F. Stephens
Fluid generators, Constructiou of motive.....F. S. McKibben
Fluid-pressure impact-engine....J. Kincaid
Fluid substances, Desiccating.....W. S. Osborne
Flush-tank.....K. Kohler
Flying-machine.....S. Moutgomery
Footwear-mold.....M. C. Clark
Forging machine, Metal.....J. Fielding
Form, Garment.....C. H. Posner
Fuel-press.....D. C. McCan
Fnnnel indicator.....C. F. Sendall
Furnace.....H. Strand
Furnace-regulator, Thermo-electric.....J. H. Bobbitt
Furniture-fastener.....T. J. Call
Garbage-cans, &c., Stand for.....W. S. Amberson
Garden-rake.....A. E. Engstrom
Garment-support, Extensible....S. Himmel
Gas and liquids, Automatic shut-off system for.....C. D. Miller
Gas-burner.....G. Helps
Gas-engine.....F. O. Kilgore
Gas-engine.....S. J. Webb
Gas machines, Constant-supply device for vaporizing fuel.....J. F. Barker, Jr.
Gas-pressure regnlator.....W. A. Fenton
Gas-producers, Vaporizer for.....B. M. Aslakson
Gas-regulator.....G. A. Hout
Gases, Cooling and liquefying.....G. Hildebrandt
Gaseous-fnel burner...H. and C. Schneider
Glass, Method of and apparatus for drawing.....T. Spillane
Glassware fire-polishing apparatus.....A. J. Sanford
Glassware fire-polishing buruer..2 pats.....A. J. Sanford
Glove, Base-ball.....C. M. King
Gluing-machine.....J. Buffelen
Gold from river-beds, Means for extracting.....J. H. Batten
Gold-saving apparatus.....W. H. Hackney
Grading, digging and leveling machine, Combined.....D. E. Graves
Grain-cutting device....B. B. Tnrner et al
Grain-shocker.....J. McCormick
Gramophone.....F. Haye et al
Gramophone, Multiplex.....H. E. Markle
Grate-bar.....A. Wilderspin
Grinding or reducing alfalfa to meal, Mill or macbine for.....J. Wyss
Gun-sight.....N. S. Sober
Gun, Take-down.....T. C. Johnson
Hammer-drills, Valve for.....V. J. O'Brien
Hammer, Electric.....B. M. Dntton
Hammock-support.....I. E. Palmer
Harness for controlling animals.....A. Byrd et al
Harrow-cleaning attachment....A. J. Olson
Harrow, Combination....J. L. Buckingham
Harvester-tedder attachment.....J. T. Oliphant et al
Harvesters, Excavating mechanism for beet.....H. F. Barber
Hat-pin.....W. N. Seibert
Hay-press, Portable.....J. M. Dolan et al
Head-forming device.....S. Roman
Headlight, Locomotive.....M. A. Ross
Heater.....C. C. Schaefer
Heating devices, Regulatiug..H. C. Mallory
Heating system, Steam.....J. Collis
Heating unit, Electric.....H. M. Smith
Hinge, Spring door.....H. K. Hansen
Hog-ringer and tool, Combination.....W. G. Robinson
Hoisting mechanism.....G. W. Mnrray
Hoisting plants, Device for regulating the feeding of power in.....J. Iversen
Horn, Sound.....A. G. Kaufman
Horse-detacher.....E. P. Copenhaver
Horse, Foldiug extensible..W. Pence et al
Horse holder and releaser, Mnltiple.....T. C. H. Wedge
Horseshoe.....M. D. Brillhart
Horsesboes, Non-slippable attachment for.....A. J. Sangster
Hydraulic motor.....P. T. Coffield
Hydrocarbon-burner.....I. L. Owens
Incnbator.....J. M. Sherman
Indenting-machine.....W. B. Keighley
Inhaler.....I. Bucceri
Ink-well.....H. Malick
Insect-destroyer.....I. P. Farrington
Insect-destroyer.....T. P. Wallis
Insulating-bnshing.....C. H. Thordarson
Ironing-machine.....H. Priee
Jack.....O. Greenstran
Jig.....F. L. Buchanan
Journal-box for rock-shafts, Adjustable.....J. I. Mengis
Key.....F. C. Eckert
Key-ring.....A. Bippart
Lactalbumin, Making a neutral sodium salt of.....E. Fisener et al
Ladder, Step.....E. Bentley

Lamp, Arc....T. J. Anderson
Lamp-bracket, Adjustable....R. G. Diehl
Lamp, Electric-arc....H. Beck
Lamp, Incandescent electric....A. F. F. Stodd
Lamp receptacle or socket, Electric....W. S. Ryan
Lamp socket, Incandescent...Y. Kawasaki
Lantern, Signal....A. H. Handlan, Jr.
Last-jack....C. C. Cole
Latch, Rim....P. Seisler
Lavatory....J. H. Danver
Lawn-trimming shovel....J. Reichert
Ledger, Loose-leaf....C. H. Gardner
Leueo diethylgalloeyanin....W. Lommel
Leveling deviee, Universal...G. A. Rhodes
Lever, Uncoupling....W. P. Murphy
Lightning-arresting apparatus....T. M. Stevens
Liquid-eooling device....D. H. Moore
Liquid-fuel burner....F. S. McKibben
Lock....P. Ziron
Loek....J. Sipos
Loom picker-check....S. Toyoda
Looms, Filling feeder or magazine for automatic....S. N. Paquette
Low-quad molds, Control mechanism for....J. S. Baucroft et al
Lubricating means for axles, bearings and the like....W. J. Greening
Mail catching and delivering device....A. J. Hughes
Mail-ehute....F. E. Anderson
Mailing device, Coin....A. E. Hall
Massage apparatus....H. C. Karpenstein
Mateh-holder, Pocket....D. L. Block
Mattress, Wire....C. J. Witzel
Measuring apparatus, Bootmakers'....W. Church
Measuring deviee, Automatic liquid....H. Morris
Measuring instrument, Electric....R. D. Hickok
Meat and fruit press....E. Walker
Metal-euttiug maehine....W. Ross
Mine-ventilating apparatus....W. Dunn
Mitt, Base-ball....C. M. King
Mold-drying apparatus....J. C. Davis
Motor....N. Lombard
Motor control....H. Heymanu
Motor starting device, Electric....D. H. Plank et al
Mower, Lawn....J. H. Auble
Mower, Lawn....S. T. Nelson
Musie-spool....P. Welin
Musical instrument, Coin-controlled pneumatieally-operated...T. I. Shannon et al
Musical instruments and music-rolls therefor, Controlling mechanism for self-playing....T. B. Powers
Musical instruments, Automatic winding attachment for mechanieal....E. E. Welte
Nest and brooder, Combined..W. H. Parker
Night-lock....W. H. Taylor
Nozzle, Spray....L. W. Cushman
Nut-loek....W. T. Payne
Nut-loek....B. D. Kemp
Nut-splitting and bolt-nipping tool....J. Whisler
Obstetrical instrument, Exteusion....L. Goshorn
Oil, Apparatus for saturating the ground with....J. E. Ward
Oil-burner....R. C. Casad
Oils, Treatment of mineral and vegetable 2 pats....J. J. Hood et al
Order-slip, Manifolding....G. E. Morton
Ore concentration....H. L. Sulman et al
Ore-eoncentrator....S. R. Swain
Ore, mineral and coal breaker....I. and H. K. Christ
Ore separating and concentrating machine....W. R. Lins
Oven-doors against their seats, Device for pressing....P. Riecke
Overshoe-retainer....L. Harrold et al
Packing for elevators, Plunger....J. C. Phelps
Paeking-ring....C. E. Drown
Paper-bag holder....H. L. Snyder
Paper coating and sizing eomposition and proeess....H. V. Dunham
Paper, Craping....A. and J. Funke
Paper-handling-machine eontroller....H. C. La Batt
Paper holder and eutter, Roll....H. B. Wallace
Pen, Fountain....R. N. Saha
Pen, Reservoir....R. Young
Penholder....J. Schwartz
Perfnme-tablet, Soluble..R. W. Whitlateh
Phonograph-record, Composition for....J. W. Aylsworth
Phonograph-record eylinders, Carton for....N. C. Durand et al
Photographic emulsion....Y. Schwartz
Photographic pictures, Preparing....R. Widmann
Piano....L. M. Cook
Pianos, Tempo-eontroller for automatic....A. H. Stuart
Pianos, Top-stitch for grand....P. Weber
Pipe, Removing scale from....H. A. F. Petersen
Piston-ring....J. Stoddard
Plank, Extension....C. C. Anderson
Pliers, nippers and similar tool....W. A. Bernard
Plow attachment....L. Dettrick
Plow, Breaking....J. W. Majek
Plow harrow attachment, Sulky....I. S. De Witt
Plow, Mole....A. G. Hermanson
Pneumatie cleaner....F. H. Hirth
Pneumatie-despateh-tube apparatus....C. F. Stoddard
Pneumatie-despatch-tube apparatus..2 pats....A. W. Pearsall
Pneumatie-despatch-tube-apparatus carrier....C. F. Stoddard
Poisoning product, Animal....F. Bolduan et al
Poke, Animal....J. W. Guffin
Post....W. T. Hicks
Post-mold....W. T. Hicks
Potato-bug exterminator....S. W. Reed
Power-transmitting device....H. W. Hunt
Pressing-iron stands, Shoe for....F. E. Emery
Printing-maehine....E. M. Wildey
Printing machine, Blue....N. H. Brown
Printing on rubber footwear, Maehine for....J. W. Moore
Printing-press self-feeder....L. Sgal et al
Printing-presses, Cylinder-driving mechanism for....R. T. Johnston
Prints, Making multicolor....V. Peterson
Projectile....G. E. Wells
Projeetiou apparatus....A. H. F. Perl
Pulley....C. A. Brinley
Pump....J. E. Naughtin
Pump-governor....W. H. Biee
Pump, Steam....J. March
Punch, Railway-ticket....H. E. Palmer
Rail and joint therefor....B. Brill, Jr., et al
Rail-drilling machine....F. E. Place et al
Rail-joint....R. Burgunder
Rail-joint....J. W. and E. J. Enright
Rail-joint support....G. Floyd
Rail-spike....J. F. Limberg et al
Rail-support, Three-tie....G. G. Floyd
Railway bonding system, Electric....G. H. Lindsey
Railway-switeh, Automatic..C. E. Bandfass
Railway-tie....V. E. Raudall et al
Railway-tie....J. B. Martin et al
Railway-tie, Metallic....S. T. Wilson et al
Raisin-stemmer....W. C. Anderson
Rake....J. B. Menzi
Raker gage and joiuter....S. C. Miles
Razor holder for frame, Safety....W. Schmidt
Razor-honing apparatus....L. Alfano
Receptacle for liquids....J. W. Kaufmann
Receptacle for medieines and the like, Hanging....J. B. Smith
Receptacle, Metallic....E. Ryan
Recording deviee....G. F. Card
Reel..3 pats....F. Mossberg
Refrigerating appliance....R. W. Emerson et al
Refrigerator-pail....L. I. Flood
Regenerative reverberatory furnace....F. A. Leas
Relief device....R. Conrader
Resilient wheel....A. H. Pelonbet
Ring-blanks and applying them to articles, Machine for producing....J. J. Rigby
Rivet....E. B. Stimpson
Rope-fasteuer....L. C. Sims
Rope-jockey....R. C. Leedham
Rotary steam-engine....J. Schuller et al
Ruler and paper-cutter, Combined....F. A. Dibrell
Sack....C. L. Weatherwax
Sad-iron, Electrie....H. G. Levy
Sample-holder....C. M. McLeod
Sash-weight....T. Holland
Sash, Window....J. V. Edwards
Sash, Window....E. M. Matthews
Saw....J. Sigoloff
Saw-handle....W. S. Locke
Scleroscope....A. F. Shore
Scow....C. E. Fowler
Seythe....V. P. Herbold
Sea power-generator....R. M. Mobius
Seal-lock....C. W. Gill
Seed liner, Cottou....H. E. Sessions
Semaphore mechanism....W. K. Howe
Sewage-disposal plant....M. J. Wiest
Sewing-machine....L. Onderdonk
Sewing-machine attachment..G. O. Beasley
Sewing-machine, Drop-head....S. A. Davis
Sewing-machine, Hemstitch..L. Onderdonk
Shade-holder coupling....E. F. Pierce
Shaft-reversing mechanism...J. D. Mooney
Shaping machine, Duplicate....O. Jensen
Sheet-iron boxes and other tinned articles to render the same suitable for beiug detinned, Cleaning old tinned....K. Goldschmidt et al
Shell or lift-van, Collapsible..F. F. Hedden
Shirt, Sweat....J. W. Jordan
Shoe quarter, lining, pull-strap and exteusion double baekstay, Combination....J. Mitehell
Show-case....A. Anderson
Show-case....O. J. Marsh et al
Show-case....H. C. Wallace
Shuttles, Device for preventing rebouud of....H. Cote et al
Sifter, Ash....C. F. Nolte
Sign....J. M. Franeis
Sign....J. C. Smith
Sign, Illuminated....E. J. Kellner et al
Sign-supporting attachment....J. J. Kegler
Signaling device....M. J. Wohl et al
Silk holder, Darning....J. B. Eisman
Singeing textile fabrics, Device for..G. Gin
Sink-stopple....M. S. Hufsehmidt
Siphon....E. C. Cook
Skating-rink and merry-go-round, Combined....C. A. Ancil et al
Skid....W. A. Campbell
Sleigh....B. M Wentworth
Smelting pyritic ores..J. P. Channing et al
Snow-machine....C. Reynolds
Soap-dispenser....C. E. Wade
Soldering chains....G. H. Benjamin
Soldering machine, Can..2 pats....J. Coyle
Soldering machine, Can....D. P. Robinson
Solenoid operating meehanism....E. M. Hewlett
Sound-reproducing machine....L. J. Gerson
Spades, Auxiliary tool for use in eonneetion with....E. M. Skinner
Spark-plug....G. Walzel
Speed-controller....J. T. Cowley
Speed-gage....L. A. Casgrain
Spinning and other purposes, Producing durable solutions for....R. Linkmeyer
Spittoons, Apparatus for cleansing medical....L. Thieme et al
Spray-head....D. M. Leuhrs
Spring-jaek structure....H. J. Kusel
Stationery....M. I. Hufey
Steam-engine....J. March
Steering-knuckle....T. V. Buckwalter
Sterilizer....S. Blickman
Still....I. M. Lee
Stone, Casting artifieial....J. B. Simpson
Stone-saw....J. R. Pierce
Stop and waste, Compression....P. Mueller
Storage battery....C. F. Washburn
Stove, Cook....W. L. Crumrine
Stove, Gas....T. M. Dudgeon
Stove, Heating....W. Heuermann
Straightening-machine....J. P. Haga
Suctiou-cleaner, Portable hand-operated....D. P. Moore
Swimming apparatus....W. H. Boregard
Switch-bar-adjusting device....J. E. Conley
Switch-lock....P. F. Angenbraun
Switch-operating mechanism....G. Flessa
Switch-operating mechanism....K. Schmitt, Jr.
Switeh-point-throwing mechanism....S. Lochowicz
Switchboard construction....W. M. Scott
Syringe....P. J. McElroy
Syringe, Portable fountain...A. L. Dawson
Table....P. C. Nihil
Table....G. Shryver
Tank-heater cover....H. G. Miller
Taper and making same, Seamless plated....R. G. Schutz
Telegraph receiver, Printing....J. Burry
Telegraph receivers, Type-carriage-propelling mechanism for printing..G. S. Hiltz
Telegraphy....I. Kitsee
Telephone system....R. C. Livingston
Telephone system....J. B. Taylor
Telescope, Hinged double....R. Straubel
Telescope lens system, Galilean....M. von Rohr
Textile fabric....G. H. Smith
Tie-plate..2 pats....W. L. De Remer
Tile-mauufacturiug apparatus....W. T. Nicholls
Tire, Automobile....G. F. and C. C. Annis
Tire-carrier....C. F. Batt
Tire for vehicle-wheels, Solid....A. Mans
Tire-plug....L. A. Bonrqueuez
Tire, Pneumatic....W. B. Hartridge
Tire, Wheel....T. Midgley
Tires for vehicle-wheels, Means for securing....C. G. Cabanue
Tongue and groove cutter, Dovetail....C. Bodmer
Torch, Contractor's....A. F. Jenkins
Toy figure, Flat....G. Noaek
Toy, Flying....W. C. Capewell
Trace-fastener....T. E. Ewer
Traek-channeler, Electropneumatic....A. H. Gibson
Tray, Jewelry....G. C. Reuckert
Tray, Wash....L. L. Browne
Tread, Wear-resisting and non-slipping....P. W. Pratt
Trick-box....A. Jedel
Trolley-switch....F. L. Sessions
Truck, Car....J. C. Barber
Twine-holder....F. B. Shuman
Type and other machines, Driving or transmission mechanism for....J. S. Baucroft et al
Type-bar and typographic form....F. H. Richards
Type-machines, Low-quad mold for....J. S. Baucroft et al
Type-matrices, Driving-press for....J. S. Baucroft et al
Type-mold, Low-quad..J. S. Baucroft et al
Type-writing machine....A. T. Brown
Type-writing machine....W. G. Duuham
Type-writing machine....G. A. Seib
Type-writing machiue....R. H. Strother
Type-writing machine....A. J. Briggs
Type-writing maehine....R. W. Uhlig
Umbrella, Folding....O. E. Walton
Umbrella, Folding....H. Helgerson
Valve....J. G. Nolen
Valve....E. A. Lacy et al
Valve, Automatic pressure-reduction....W. H. Bice
Valve-gear, Spriug-holder for....G. Graham
Valve, Pressure-retaining....H. F. Bickel
Vegetable-cutter....J. P. Eckert
Vehicle auxiliary spring....J. Eckhard
Vehicle foot-rest....H. D. Hausford
Vehicle-lubricatiug means, Motor...R. Huff
Vehicle-spring....W. E. Eastman
Vehicle-top-bow holder....S. T. Allen
Vending machine, Cigar..W. D. Evans et al
Vending machine, Merchandise....H. E. Hunter
Vibration-indicator....B. Volkmar
Vise....R. J. Schlosser
Wagon-brake....C. D. Linton
Wagon-brake....H. M. Mahan
Walls, Making collapsible and expansible corrugated....W. M. Fulton
Washboard....C. P. St. John
Washboard attachment....J. R. Casey
Washing and conveying apparatus, Combined....A. L. Duncan
Washing-machine....H. S. Judd
Washing-machine....J. Vierling
Washing-machine, Laundry....E. Probst
Waste and overflow, Combined....H. and P. Mueller
Water-closet connection....J. J. Cosgrove
Water-closet-ventilating device....A. A. and A. J. Bruder
Water-cooler....A. N. Rose
Water-heater, Portable....O. P. Churchill et al
Water-tube boiler....S. C. Munoz
Weather-strip, Metal....P. L. Hedberg
Weeder....R. M. Chambers
Weighing, bagging and paeking apparatus....H. Richardson
Weighing-machine....H. Richardson
Weight-hanger, Automatic....G. Reddish
Wheel construction....C. A. Frick
Wheel coupling, Grinding and polishing....M. Cummins
Wheel-guard....A. Fiedler
Wind-shield....E. S. Adams
Window-seat....T. S. Richardson
Window-tent....C. A. Hereules
Wire fabric....W. F. White
Woven fabric, Asbestos-faeed..G. H. Smith
Wrapper, Tubular....H. J. Blocki
Wrench....J. A. Bledsoe

DESIGNS.

Doll-pattern....F. A. Hays
Glass vessel....B. F. Davies
Knife and fork holder....C. Myland
Lamp, Vehicle....R. H. Welles
Plate or similar article....J. H. Venon
Spoon, fork or similar article, Handle for....C. Osborne
Suction cleaning-machines, Casing for portable....D. P. Moore et al

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MECHANICAL PATENTS.

Abrading apparatus....G. A. Hassel
Acid, Making concentrated sulfuric....O. Proeiss
Acid, Making sulfuric....O. Proeiss
Acids, Arsenoarylglycollic..P. Ehrlich et al
Advertising device....J. F. Abbott
Advertising deviee....H. Tas
Aeroplaue....G. Geraldson
Aeroplanes, Stabilizing means for....H. M. Chase et al
Air-brake apparatus, Combined automatic and straight....W. V. Turner
Air-brake, Automatic railway..W. K. Omick
Air-compressor....W. Wright
Air-duct....D. I. Cooke
Alcohol and by-products and apparatus therefor, Manufacture of....H. O. Chute
Alloy, Electrical-resistance....J. T. H. Dempster
Aluminum fluosilicate, Making..E. F. Kern
Amusement mechanism....R. C. Barrie
Animal-releasing device....D. Roschen
Animal-trap....M. Jaeger
Atomizer, Pocket....R. F. Richards
Automatic safety-burner....J. L. Miller
Automobile-fender....F. Meattauer
Automobiles and similar vehicles, Travel-recorder for....C. A. Miller
Awning..2 pats....C. J. Kapka
Axles, Produeing front yoke....A. Johnson et al
Bag....H. J. Miller
Bait, Artificial....J. Bohannan
Baling-press....E. Ninfeldt
Baling-presses, Automatic binding attachment for....C. A. Robben
Ball-bearing wheel....C. M. Raymond
Band-cutter and feeder....C. I. Blakley
Bank, Pocket....A. L. Andrews
Batteries, Wood separator for secondary....L. H. Flauders
Battery separator, Storage....E. M. Fitz
Bearing, Roller side..2 pats....P. N. Moore
Bearing, Thrust..2 pats....O. Juuggren
Bed, Folding....L. A. Brownlee
Bed, Invalid....J. B. Ford
Bed-spring tightener....J. J. Tlustos
Bending and straightening machine....J. Olson
Bicycle attachment....J. H. Clark
Billiard-table tops and the like, Portable stand for....E. S. Rayner
Blacking-box....M. A. Evans
Boat attachment for delivering seines into the water....N. O. Davidson
Boiler-arm....A. J. Aderhold
Boiler fire-box....J. M. McClellon
Book or binder, Loose-leaf....E. Jay
Boot and shoe welt....G. F. Dnuu
Boring-tool....T. J. Hines
Bottle, Antirefillable....H. N. Cupp
Bottle-eappiug machiues, Guard attachment for....L. Rod et al
Bottle, Ink....W. Sundquist
Bottle, Non-refillable....F. B. Locke
Bottle or other receptacles for containing liquids....G. W. Banta et al
Bottle-stopper....J. Hedlund
Bottle-treating machine....L. S. Pfouts
Bottling-machine....J. H. Champ
Box, ejeetor and eover, Combined....H. C. Leighton
Brake-shoe....J. A. Panton
Brewing....W. P. F. Moeller
Bridge, Bascule....A. H. Scherzer
Bridges, Safety device for preventing runaway accidents ou....M. Goodman
Briquets, Composition for....W. J. Shaw
Brush-holder....M. Brodeur
Buckle....J. A. Wheeler, Jr.
Buckle....S. S. Arnold
Buckle, Harness....G. Schoenberger
Bur-remover....E. H. Lescure
Bur-remover....A. J. Sellers
Burglar-alarm....E. A. Canavan
Button-ring....C. S. Comstock, Sr.
Cabinet, Receiving....P. W. Hebebraud
Cabinet, Sectional....L. H. Walker et al
Cable-grip....J. S. Skelly
Calendering-roll..2 pats....J. L. Perkins
Calorimeter-bombs, Holder for....C. J. Emerson
Can-eover....L. D. Lewis
Can-opener....H. Ferguson
Can-washing maehine....H. Goodhue
Candy-stiek-cooling apparatus....P. R. Camp et al
Car-bunk and lodging-stake....O. S. Carroll et al
Car, Dumping....R. Davenport
Car grain-door....J. Henry
Car, Passenger-railway....L. E. Paden
Car, Railway-track....M. L. Jenkins
Car safety attaehment....B. F. Rogers
Car-wheel....A. S. Gustafson
Car-window guard....F. T. Parker
Cars, Automatic step for....N. E. Landin
Carbonating and beer-dispensing apparatus, Combined....A. D. Jones
Carbonized fabric, Making...F. L. Horton
Carbureter....F. W. Tuerk
Cards, Playing....D. S. Frackelton
Cart....J. H. Rye
Cart....M. C. Myers
Casting lead pots and buckles and loading said buckles in said pots, Machine for....A. J. Meier
Cementing-maehine....N. Marshall

Chain-stretching device.....G. Lemak
Chair seat attachment, Barber's.....A. R. Lerro
Churn.....L. Hofer
Circuit-breaking mechanism...W. M. Scott
Circuit-controller.....H. E. Leppert
Clasp.....R. A. Moore
Cleat.....H. P. Hedrick
Clevis.....T. D. Besten
Clocks, Ponch for portable watchmen's.....P. Moosmann
Clothing support, Extensible....C. T. Wilt
Clutch, Friction.....R. Huff
Coal-washing apparatus.....H. Cory
Cock, Stop.....L. S. Stacey
Cocks, Lock for fluid.....G. S. Jacobs
Coin-controlled lock.....J. S. Merritt
Coke-oven.....W. H. Blauvelt
Collar for coats and other garments.....L. Wolf
Collar, Horse.....W. F. Baker
Coloring composition....R. H. Enoch et al
Compass, Non-magnetic.....A. H. Lessells
Concrete chimney.....I. B. Spaulding
Concrete conduit construction, Form for..F. S. Graef
Concrete construction, Reinforcing-frame for.....E. Cannes
Concrete dams, walls, bridges, conduits, sewers, &c., Making.....F. S. Lamson
Concrete structure.....T. Hall
Concrete structure, Reinforced..J. Gilmore
Concrete structures, Making stone.....C. F. Morrill
Concrete-wall mold or form....I. N. Gates
Condnit.....E. R. Ramsey
Condnits, Outlet-fixture for...H. T. Paiste
Connecting-clip.....G. B. Dusinberre
Corner-locking machine.....J. H. Pickett
Coupling or mortise bracket..J. A. Kimball
Cover-raising device.....J. A. Sebring
Crane.....C. Pauli
Crate, Shipping.....F. Simon
Crates, Partition-strip for bottle.....E. C. Rose
Cream-separator protector.....P. Beechel
Cultivating implement.....J. F. Windhorst
Curtain-pole and shade-roller supporting device.....A. Pagnard et al
Curtain-stretcher.....W. Schwab
Cuspidor.....G. D. Bulmer
Cuspidor, Cabinet.....P. Johnson
Cuspidor, Sanitary.....M. F. Troy
Darning device.....R. A. Smith
Dental plate.....J. Petry
Dentist's flask.....J. R. Buchanan
Die-stock, Ratchet.....E. M. Fuller
Directory, City street.....P. Noguier
Dish-washer.....M. J. Weaver
Disinfector or deordorizer.....J. W. H. and E. R. Williams
Disintegrator.....W. E. Damon
Dispensing apparatus.....C. R. Warters
Display device.....M. Gelas
Display-rack..2 pats.....H. E. Feldman
Distributing apparatus.....F. I. du Pont
Door for mines, quarries, elevator-shafts, &c.....C. Matthews
Door-hanger track.....E. W. Topping
Door-lock.....C. R. Erkens
Door-lock.....P. H. Nefflen et al
Door-lock, Portable....W. S. Callery et al
Door-operating device, Mine....F. C. Todd
Door, shutter, &c., fastener.....M. Dessaner et al
Door structure.....F. Y. Parsons
Doors and the like, Locking means for.....P. Schmahl
Doors, Automatic locking device for hatchway.....M. Hegbom
Draft and buffing mechanism.....H. T. Krakau
Draft appliance.....C. Barker
Draft-arm, Double-stream.....B. K. Dosterschill
Drainage system.....C. W. Osborne
Drawing-board.....C. C. Hastings
Dredging apparatus.....J. J. Connell
Dressmaker's fitting-stand.....B. J. Buckingham
Drill.....C. H. Oslund
Drive gear-wheel.....J. E. Jones
Drive mechanism.....L. A. Hill
Drum and parts thereof, Centrifugal.....A. G. G. Salenius
Drum, Crimping.....G. E. Mirfield
Drums, Safety-vent for expansion.....G. E. Hulse
Dust-removing apparatus....D. T. Kenney
Easels and the like, Support for.....O. J. E. Schmitt
Egg-boiler.....C. B. Martin
Egg-shell remover.....A. Uhlir
Eggs from boilers, Apparatus for timing and removing.....C. S. Kinney
Electric bond.....T. J. Cope
Electric buzzer.....J. F. McElroy
Electric-light hanger.....J. P. Watson
Electric-light hanger.....E. H. Weber
Electric lights, Key-turner for..B. English
Electric metering system.....M. O. Troy
Electric sparking device.....J. A. and B. A. Jeffery
Electric wiring, Slack-spool for.....H. Van Altena
Electrical-conductor switchboard.....J. F. Skirrow
Electrical distribution system.....W. A. Turbayne
Elevator..4 pats.....H. A. Humphrey
Engine sparking plug, Internal-combustion.....W. H. Horner
Engines, Accessory for internal-combustion.....E. D. Means
Engines, Attachment for controlling the fuel-supply of internal-combustion.....G. and F. Deeg
Engines, Vaporizer or carbureter for gas..C. D. Shain
Excavating apparatus..3 pats.....C. L. Hopkins
Expansible bit.....E. Pastore
Explosive-engine.....F. J. Gremel
Explosive-engine.....E. Gathmann
Extension-table.....E. Tyden
Eyeglass-cases, Machine for covering.....W. P. Devine
Eyeglasses..2 pats.....L. F. Adt
Eyeglasses.....E. B. Meyrowitz
Eyeglasses.....J. H. Collins
Eyeglasses and spectacles, Mounting for...W. S. Samson
Fan, Hair-drying.....E. H. Amet
Faucet.....W. Haynes
Faucet-handle.....H. Mueller
Feed-roller and pressure-guide, Combined..E. S. Giles
Feeding device, Poultry and animal.....I. M. Frederick
Feeding-machine.....G. E. D. Parker
Fence-gate.....S. R. Leonard
Fence machine, Wire.....I. N. Morford
Fence-post, Anchoring.....F. E. Saunders
Fence post, Portable wire.....W. B. Stambaugh
Fertilizer-distribnter.....O. B. Beard
Fertilizer-distribnter.....D. Cahill
Fiber, Producing brown, olive and green shades on the.....H. Schmid
File.....A. E. Landon
Filing systems, Guide-card for vertical.....T. J. Amberg
Filter and cooler, Combined water.....A. F. Randall
Filtering and drying apparatus.....E. N. Trump
Fire-alarm system, Automatic.....A. Goldstein et al
Fire-escape.....M. F. Welch
Firearm.....T. C. Johnson
Firearm, Take-down.....W. Bennett
Fish-bucket, Combination.....N. D. Fly
Fishing appliance.....C. E. Schindler
Flat-iron, Gas.....F. D. Hegwood
Flower-holder, Illuminated.....F. Muschenheim
Fluid-regulating apparatus..M. F. Newman
Fluid-motor.....A. Kelso
Flushing apparatus.....H. J. Gosse et al
Flushing devices, Seat-operated mechanism for actuating.....J. G. Hodgson
Flying-machine.....T. M. Crepar
Foldable table.....S. M. Bond
Folding-machine.....J. Maitland
Folding table.....J. C. Eckartz
Form, Dress.....R. Rubin
Fruit-box press.....L. M. Cox
Furnace.....A. A. E. Sterzing
Fuses, means for igniting.....S. Lilley
Gage.....E. B. Howell
Game.....F. Boulware
Game apparatus.....E. H. Johnson
Game-board.....P. R. Cole
Game-points indicator.....F. J. Weber
Garbage-crematory.....W. K. Herbert
Garment.....W. T. Connor et al
Garment-fastener.....G. W. Prentice
Garment-fastening device..G. W. Prentice
Garments, Making.....G. M. Gray
Gas-analysis apparatus.....G. M. S. Tait
Gas and oil engine.....A. G. Pace
Gas-engine.....A. G. Pace
Gas, Manufacture of carbonic-acid.....A. E. Knowles
Gas or vapor engine.....G. E. Ireland
Gas-service pipes, Automatic cut-off for.....J. C. Klassen
Gases, Apparatus for removing tar from coal.....E. Solvay
Gate.....E. J. Myers
Glass-pot.....H. F. Clark
Glue-applying machine.....A. Cohn et al
Gluing apparatus.....P. H. Rue
Governor.....H. N. Motsinger
Grain separator and cleaner.....F. Prinz
Grain-treating machine.....R. Hart
Grate for refuse-consumers.....J. A. Fried
Grater.....G. J. Tatro
Grinder, Cutter.....C. J. McCallum
Grinder, Forage and grain.....W. H. Hess
Gripper.....T. J. Sproul
Handling articles, Machine for.....L. M. Parkhurst
Harrow and land-roller, Combined disk.....J. Moore
Harrow, Blade.....C. L. Wall
Harrows and the like, Soil-engaging blade for.....E. M. Kramer
Harvester.....J. Estes
Harvester, Grain.....W. Harlin et al
Hat-fastener.....R. Idone
Hay-forks, Sling attachment for.....J. A. Cross
Hay-loader.....F. A. Battershell
Hay loader and stacker.....A. F. Snyder
Hay-sling lock or trip.....E. Thompson
Headlight or illuminator....H. L. De Zeng
Heat-regulator, Compensation.....M. J. Farquhar
Heating system, Steam.....J. G. Midgley
Hinge for doors, gates and the like.....J. D. Roots
Hog trap and loading chute....H. G. Carr
Hoist.....W. A. Hare
Hoist and dump, Vertical.....U. S. Shelly
Hoisting-machine.....R. A. Ogle
Horse-overshoe.....A. Boyd
Horseshoe.....W. M. R. Myers
Hose-coupling.....E. E. Gold
Hose-nozzle.....H. Gibbs
Humidor.....G. H. Lee
I-beam and the like.....G. A. Lund
Ice-cream-making machine....J. Willmann
Ice, Making.....P. R. McCrary
Inclined elevator.....J. W. Reno
Index, Folding.....C. E. Hudson
Indicator-lock.....E. H. Jones
Indigo leuco bodies, Manufacture of.....O. Liebknecht
Injection apparatus....W. S. Rodgers et al
Insect-trap.....M. Schwartz
Instrument, Compound.....W. C. Stollberg
Interlining and bust-form, Combined.....M. Goldstein
Interlocking mechanism.....L. R. Winslow
Internal-combustion engine..E. A. Rundlof
Internal-combustion engine.....K. J. E. Hesselmann
Internal-combustion engine.....J. Loftus
Ironing-board.....G. F. Neher
Ironing-board.....H. L. Pendleton
Jacquard apparatus.....B. Salzer et al
Jar-closure.....C. T. Coll
Knife cleaning and polishing machine.....H. J. Brashier
Knife-switch, Quick-break.....C. D. Platt
Knitting.....E. E. Kilbourn
Knitting-machine, Circular..G. L. Ballard
Knobs for locks and latches, Thumb.....H. S. Lockwood
Lace fastener, Shoe.....J. D. Eastman
Lacing-hook for shoes, gloves, &c., Guarded.....H. A. Wentworth
Lacing, Shoe.....F. Duquette
Ladder.....H. A. Sager
Lamp.....A. R. Pritchard
Lamp hanger, Arc.....J. M. Sutor
Lamp lock, Electric.....E. H. Weber
Lamp-socket support, Electric..H. E. Plass
Lanterns, Globe-holding device for tubular.....D. C. Kline
Last-jack.....L. Hackett
Latch.....C. E. Lowe
Leather-surfacing machine..C. A. Lombard
Legging.....N. Clincostram
Level and plumb, Combination.....M. A. Wagner
Lifting-jack.....J. H. Burkholder
Lightning-arrester.....B. H. Mann
Lightning-conductor point and point-rod protector.....C. Bajohr
Linotype-machine..2 pats.....W. H. Scharf
Liquid-fuel burner.....J. A. Mitchell
Liquid mixing and containing apparatus.....F. Purdy
Liquid-purifying apparatus.....L. Linden
Liquid-separator, Centrifugal.....J. P. Johansson
Liquids, Device for drawing off measured quantities of.....C. L. Newland
Lock.....C. E. Lowe
Lock.....A. Lawrence
Loom.....J. C. Williams et al
Lubricator.....L. V. Hood
Lubricator.....O. Hajek
Luximeter.....W. D. Ryan
Magneto-generator.....C. W. Wilson
Mail-bag catcher.....J. A. Follman
Mail-bag catcher and deliverer.....G. W. Harlan
Mail-box.....J. E. Shank
Mail-chute.....L. Ehrlich
Mail delivering and receiving apparatus.....P. Friederick
Mail-tying device.....J. A. Follman
Mandrel, Expanding.....H. W. Lunceford
Manifolding device.....H. H. Hill
Manure-spreader.....S. C. Reveley
Marker for laundries and the like, Garment.....D. C. Voss
Measuring instrument.....R. Osterberg
Measuring instruments, Maximum-indicator for.....C. D. Haskins
Merry-go-round.....F. C. Angwin
Metal-working machine....W. S. Davenport
Metallurgical process....T. L. Willson et al
Milk-can.....C. E. Shreve
Milk, Sterilizing.....C. C. Palmer
Milling-cutter, Gang.....J. A. McGregor
Miter-cutter.....E. M. Whitney
Monument and tombstone.....J. Ifft
Mop.....C. W. Huff
Motor-control system.....H. B. Emerson
Motor-starting apparatus, Electric.....S. B. Paine
Motor starting device, Electric.....H. H. Lee et al
Motors, Arrangement for starting and regulating the speed of alternating-current..E. Arnold et al
Mower, Motor-driven lawn.....W. W. Harrison
Mowing-machine driving mechanism.....A. Packer
Muffler.....J. S. Mead
Music-leaf turner.....T. S. Grose et al
Music-sheet, Perforated.....F. L. Young
Musical instrument.....J. P. Hulder
Musical instruments, Pedal-action for.....J. P. Caulfield
Necktie.....C. W. T. Davies
Needle-threader.....J. McKeown
Noodle-cutter.....J. B. Boyer
Numbering device.....E. A. Crosby
Nut.....E. E. Gamon
Nut-lock.....T. J. Brophy
Oils, &c., Apparatus for the purification of.....O. Brucke
Ointment-applier.....R. A. Kooken
Optical instrument.....G. N. Saegmuller
Ore-cleaner.....A. McDougall
Ore-sizing apparatus.....C. P. Watterson
Ornament, Metal.....J. Wander
Oscillation-receiver.....G. W. Pickard
Package.....W. S. Mellen
Packing, Automatic spring....A. P. Sundt
Packing, Piston-rod.....J. S. Pendleton
Padlock.....J. K. Gross
Pail, Dinner.....D. H. Morrell
Paper box.....C. O. Mason
Paper-fastener.....F. H. Sawyer
Pencil-sharpener.....E. Weller
Phenol sulfonate of opium alkaloids.....G. L. Schaefer
Phonographs, Feed apparatus for.....J. H. Williams
Piano, Enharmonic.....F. Sitton
Piano-player.....A. T. Young
Pianos, Pumper-pedal action for interior player.....C. Warren
Picture exhibiting apparatus, Moving.....F. L. Dyer et al
Picture machine, Moving.....C. E. Dressler et al
Pile and pile structure.....F. A. Noullet
Pipe connection.....G. R. Bard
Pipe coupling, Train.....A. L. Lindh
Pipe-cutter.....G. A. Barnes
Pipe-fitting.....D. S. Ramelli
Pipe-grip.....F. M. Kenover
Planer, Plate.....A. Wood
Planing machines, Stock-scraper for wood..H. A. Perkins
Plant-protector.....G. T. Wells
Planter, Corn.....H. C. Hanson
Planter, Seed.....G. W. Barrow
Plasterer's hawk.....N. A. Hansen et al
Plow.....J. P. Jones
Plow, Cotton-thinning.....J. M. Crook
Plow, Disk.....C. J. Daly
Plow-fender.....R. Jones
Plow harrow attachment....E. M. Kramer
Plow-motor-guiding device.....E. M., E. F., and D. O. Wheelock
Plowshares, Manufacturing.....H. C. Millar et al
Plug-switch.....J. H. Kliegl
Pneumatic suction-cleaner...D. D. Griffiths
Pocket-knife, Unfolding.....J. Feinenburg
Powder-receptacle.....D. Dunwoodie et al
Power-transmission mechanism.....M. K. Golden et al
Power-transmitting mechanism, Fluid-controlled.....A. Sundh
Precious-metal-bearing materials, Treating.....P. W. Avery et al
Pressure apparatus, Automatic control for.....H. F. Thoma
Pressure-regulator.....W. Leuckert
Printing and folding machine..J. A. Boyce
Printing device, Hand.....J. I. Sanford
Projectile.....C. V. Wheeler et al
Pulleys, Belt-shifter for cone..F. F. Clarke
Pulling-jack.....W. Sylvester
Pulling-machine.....S. G. Milton
Pulverizing-mill, Centrifugal...E. H. Hurry
Pump.....F. S. Dickinson
Pump, Centrifugal.....H. Legros
Pump, Duplex spray.....M. T. McCarty
Pump, High-pressure turbine.....W. L. Forward
Pump, Lamp.....J. F. Lamb
Pump, Rotary.....F. J. Curtis
Pump to lift water, Gas...A Mico y Munoz
Pumping apparatus.....X. Caverno
Pumping device, Liquid.....F. H. Parke
Pumping-machine, Automatic.....W. M. Myers
Purse, Coin.....O. E. Allen
Radiator-castings, Pattern for.....C. W. G. Sodemann
Radiator hanger, Wall.....A. Kehm
Rail-anchor.....W. A. Walker
Rail-bond.....C. L. Cadle
Rail chair and brace, Combined.....G. A. Johnson
Rail-joiner.....C. U. Ludvigsen et al
Railway cross-tie.....J. Gearon, Sr.
Railway-crossing.....F. Stitzel
Railway-frog.....C. W. Reinoehl et al
Railway-rail fastener.....J. B. Barnes
Railway-spike.....O. J. McNight
Railway-spike.....A. L. Simon
Railway-switch device, Automatic.....R. Y. Partida
Railway-tie, Composite.....B. F. Wise
Railway-track construction....L. H. Evans
Raisin-seeder.....M. Erlenbach et al
Rake and stalk-cutter, Combined.....W. Mercer
Razor-strop.....G. A. Burseh
Reciprocating die.....F. Richardson
Reduction-machine.....J. E. Blake
Refrigerating or cooling apparatus.....G. Hildebrandt
Refrigerator.....J. Thanbald
Refrigerator-lining.....C. H. Zwermann
Rein-holder.....R. C. Murdoek
Relay.....I. Kitsee
Releasing device.....J. N. McCrary
Resistance-box.....L. T. Robinson
Rheastat, Liquid.....F. Mackintosh
Ribbon-fastener and sales-index.....D. H. Woodman
Riffle for concentrating-tables.....A. M. Kemp et al
Rifle-sight.....E. J. Phiblad
Road-roller steering mechanism.....J. G. Brown et al
Rotary engine.....J. Burleigh
Rotary gas-engine.....M. L. Harris
Rubber-heel protector.....G. G. Mirlach
Sad-iron.....M. Sunshine
Sad-iron, Gas-heated.....M. L. Udwin
Sad-iron handle.....J. M. Harper
Safe door, Bank.....G. M. Mereer
Safety-burner.....E. Roth
Salt and pepper holder.....J. T. Stapleton
Sand-drying apparatus.....H. C. Freeman
Sandpapering-machine.....G. Smith
Sash-fastener.....N. A. Booth
Saw.....J. W. Costello
Sawing and mitering machine....J. Dyer
Scarf-pin holder.....R. Fischer
Sconring, grinding and polishing machine..W. Service et al
Scraper.....F. W. McLean
Scraper, Hand-hole...H. B. Cockrell et al
Screw-driver.....M. Boyd
Scriber, Curve.....I. Kinney
Sealing mechanism, Bottle.....P. Conrad
Seeder, Hand.....J. F. Rittenhouse
Sewing-machine presser-foot.....G. S. Gatchell
Sharpening device, Knife...W. A. Jameson
Sheet-metal box.....A. E. Blackman
Ships and other places, Apparatus for discharging ashes, ballast-water, bilge-water and other materials from...G. C. Ralston
Shock-absorber.....C. Swan
Shock-absorber, Pneumatic.....A. Mans
Shoe and boot.....M. Mannesmann
Shoe-tree.....J. S. Hansen
Sign, Wind-operated revolving..J. Meyers
Signal-switch, Electric.....J. I. Ayer
Silo-feeder.....J. J. Kennel
Skein and holder therefor.....J. G. Smith
Sled.....F. A. Miller
Slicer, Bread.....V. Larson
Slimes, Apparatus for the treatment of metal-bearing.....C. H. Jay
Smoke-preventer.....L. H. Long
Smoke-stack.....E. T. Jenkins
Smoking-pipe.....S. P. Etter
Snap-hook.....W. A. Schleicher
Snow-plow.....P. Hannagan
Soap-slabbing machine.....C. W. Aiken
Sound recording or reproducing apparatus.....T. A. Edison
Spade, Tiling.....F. J. Vondraeek

Sparking device.....C. H. Stonebridge
Spike, Toothed.....H. O. Crippen
Splint-cutting machine.....A. H. Hall
Spraying apparatus....W. G. R. Braemer
Spring-wheel.....P. J. Hovland
Spriug-winding device.....S. Butterworth
Sprinkler.....W. Storey
Sputum-cup and holder therefor.....C. W. Meinecke
Square, Geometrical miter.....W. Bundy
Stamp, Hand.....G. W. Walters
Stanchion.....E. A. Hoeffel
Stand.....F. J. Selden
Steam-generator for cooking purposes.....W. L. Dunn
Steam-meter.....F. E. Pendleton
Steam-superheater.....E. H. Foster
Steel, Manufacture of.....A. Reynolds
Steering apparatus.....A. Sundh
Steering-gear apparatus.....A. Sundh
Steering-wheel.....A. G. McPherson
Sterilizer and water-heater, Combined.....E. G. Stamper
Stitch-forming mechanism.....B. H. Thiesen et al
Stock-fountain.....H. C. Johnson
Stoker, Mechanical.....W. M. Duncan
Stone, Artificial.....T. M. Thom
Stove, Camp.....S. E. Balch
Stove, Coking.....H. H. McMaster
Stove, Gas or vapor.....A. F. Bauer
Strainer or separator.....H. E. Morley
Suction-cup.....E. Noppel
Superheating-boiler.....A. B. Stirling
Suspenders.....H. H. Small
Suspending device, Suction....C. A. Austin
Switch-box and support, Combined.....J. J. Odenwald
Switch-stand.....F. E. Place
Syringe, Vaginal.....I. L. Stevens
Syrup-dispensing mechanism.....L. A. Becker
Table extension-top, Knockdown.....F. B. Walter
Table-leg locking device...C. C. Hastings
Talking-machine attachment.....W. A. Chapman
Talking-machine sound-box....L. T. Haile
Tanks, Constructing bent-wood.....D. F. Whitmore
Tap, Beer.....J. Quigley et al
Target-trap.....H. E. Winans
Taximeter.....A. J. B. E. Darras
Telegraph apparatus.....R. L. Dean
Telegraph system, Secret...W. P. Phillips
Telegraphic relay.....I. Kitsee
Telephone and control system, Combined..H. G. Webster
Telephone-receiver attachment.....G. S. McComb
Telephone-wire hanger or support.....F. W. Morse
Temperature-regulating system.....W. A. Sheldon
Threshing-machine.....H. T. Seburn
Tire.....I. F. Peck
Tire-fastener.....R. W. Jordan
Tire protector, Pneumatic.....G. Vergote
Tire, Wheel.....C. E. Blechschmidt
Tobacco-pipe.....H. E. Whitney
Toilet or vanity box.....S. Davis
Tongues, Spring-support for wagon.....E. Foerster
Tool,Combination.....J. C. Dikes
Tool-holder.....H. B. Robinson
Tool-holder.....B. M. W. Hanson
Tooth and crown, Artificial..C. W. Plumley
Tooth, Artificial.....R. Galloway
Torsiometer.....F. T. Edgecombe
Toy, Automatic reversing motor.....H. T. Kingsbury et al
Transformer, Three-phase.....J. J. Frank
Tray, Wheeled.....J. N. Stewart
Trimming-cutting machiue.....D. Maus
Trolley.....C. Pauli
Trolley.....W. W. Hutchingson
Trolley-wire ice-remover.....J. W. Brown et al
Trolley-wire splicer....H. L. Griswold et al
Trowel, Adjustable.....R. W. Linville
Trnek for carrying radiators.....J. L. Welshans
Truss.....C. Pence
Tub waste-pipe, Laundry....G. S. Winant
Tube cutter and reamer.....K. Matheus
Tunnel-support.....C. C. Finlayson et al
Turbine, Elastic-fluid.....R. F. Halliwell
Turbine, Elastic-fluid.....R. H. Rice
Turbine governing mechanism.....F. Samuelson
Turbine governing mechanism.....C. H. Worsey
Turbine governing mechanism.....A. S. Anderson
Turbine or centrifugal pump....H. Lorenz
Turbine, Wind.....J. G. Childs
Turbines, System of lubrication of elastic-fluid.....O. Junggren
Turning irregular forms, Machine for.....A. Lehmann
Turning irregular forms, Machine for.....H. F. Loewer
Turpentine-cup.....G. C. Pringle
Turpentine-cup support.....G. C. Pringle
Twine, cord and the like hall....C. Berry
Type holder, Rubber.....H. S. Folger
Type setting and distributing machine....J. S. Duncan
Type-writing machine.....E. H. Berry
Type-writing machine.....G. A. Seib
Type-writing machine....H. S. McCormack
Type-writing machines, Calculating attachment for.....E. C. Walter
Umbrella, Folding.....E. H. Newmeyer
Umbrellas, canes, &c., Box for.....W. H. Beehler
Urinal-slab.....F. F. Rowell
Vacuum-cleaner.....E. Eriesson et al
Vacuum cleaning apparatus..E. W. Pierce
Valve.....C. W. Jones et al
Valve.....L. W. Eggleston
Valve.....J. Nolan
Valve.....O. E. Oleson
Valve, Float.....J. L. Mayfield
Valve, Flush.....J. H. Mahoney
Valve for wind instruments..E. K. Blessing
Valve for compound engines, Starting.....W. I. Kovalsky
Valve, Gas-engine suction...H. F. Mueller
Valve, Internal-combustion-engine.....D. V. T. A. Locke
Valve, Siphon.....F. Lutz
Valves, Means for controlling the valve movement of gate.....D. Libby, Jr.
Vault, Burial.....D. H. Brown et al
Vehicle-brake.....R. N. Martz
Vehicle canopy-top.....C. E. Walters
Vehicle emergency-brake.....H. F. Dietz
Vehicle, Motor.....G. W. Mascord
Vehicle-wheel.....W. W. Macfarren
Ventilating apparatus..2 pats..W. Clifford
Ventilating apparatus..S. V. Laughinghouse
Vessels, Apparatus for raising sunken.....N. Nelson
Voting-machine.....L. R. Winslow
Voting-machine auxiliary interlock.....L. R. Winslow
Wagon-brake.....O. Hill
Wagou, Dumpiug coal.....T. E. Bond
Wagon hoist or lift.....R. G. Ronlstone
Walls, ceilings, &c., Coustruction of tiled..G. H. Metzer
Washing and other machines, Squeeze-roll for.....F. L. Furbush
Washing-machine.....E. C. Brown
Watch, Eight-day.....J. F. Sandoz
Water-closet bowl, Vented.....J. F. Kelly
Water-closet connection.....J. J. Cosgrove
Water-heater.....L. C. Rhea
Water-heater.....W. E. Beilman
Water-heater.....H. W. Donaldson
Water-power plant.....C. A. Nobis
Water-purifier.....F. Dinghaus
Water-sprinkler.....J. M. Alden
Weighing-machines, Compensator for.....S. G. Murray
Well-drilling apparatus.....L. Schultz
Well-screen.....W. Harmon
Welts, Machine for operating upon.....J. B. Hadaway
Whiffletree connection.....J. H. Whan
Whip-lock.....J. A. Frazer
Windmill.....M. S. Swanstrom
Window construction.....A. J. Ellis
Window or door screen.....A. Miller
Window-screen.....W. L. Kane
Window-screen.....E. Riback
Window-ventilator.....J. X. O'Meara
Windows, screens, &c., Device for hanging storm.....E. C. Brown
Wire-coiling machine.....C. Wright, Jr.
Wood-smoothing machine....J. A. Crismore
Wrapper or receptacle.....A. W. Nack
Wrench.....B. Goodman
Wrench.....R. E. Harshell
Wrench.....W. E. Elliott
Zinc, Extraction of.....C. S. Brand
Zither.....J. Krienitz

DESIGNS.

Automobile-body.....E. L. Thomas
Caskets or coffins, Lug for....P. R. Zinser
Dish.....P. R. Zinser
Fence fabric, Wire.....J. P. Arthur
Post-card.....F. S. Ritter
Vacuum-cleaner casing.....M. May
Watch-charm or similar article.....H. Bashinski

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Adding-machines, Dogging mechanism for..J. A. Smith
Adding-machines, Guiding and guarding means for.....J. A. Smith
Addressing and assorting newspapers, &c., Machine for.....L. M. Nielsen
Advertising device, Moving....S. J. Scott
Air-brake hose.....C. T. Driggs
Air-brake-mechanism control device.....C. Lang
Air-compressor.....F. H. Merrill
Air-compressors, Combined governor and regulator for.....J. L. Osborne
Air-filter.....W. Blass
Air-spraying tank.....H. Mikorey
Alloy and a compound for the production thereof.....W. Rubel
Amusement apparatus.....A. Bragg
Anchor, Earth.....F. B. Miller
Automatic elevator.....A. L. Gardner
Automobile safety attachment.....T. B. Jeffery
Automobiles, Tool-driving attachment for..H. B. Peters
Axle device, Differential.....M. Markarian
Bait, Trolling.....T. J. Byrom
Bale and bale-trunk.....W. L. Spoon
Bale and like transporter.....A. and C. Winckler
Bale-tie.....W. E. Wheeler
Baling mechanism.....T. A. Killman
Baling press, Fibrous-material.....W. L. Spoon
Bank, Registering.....A. E. Jacobs
Bearing with transversely-divided rolls, Roller.....C. S. Lockwood
Bearings, Journal-sleeve for roller.....C. I. Shirley et al
Bed, Adjustable.....D. Hogan et al
Bed-couch.....G. A. Lambert
Bed, Uptilting.....N. C. Merrill
Beer-cooler, Sanitary.....P. H. Joyce
Belt-shifter.....G. C. Smith et al
Belt shifter and tightener....H. A. Perkins
Bicycle-fork.....L. H. Cobb
Bicycle spring-fork.....L. H. Cobb
Binder, loose-leaf.....H. A. Kretschmer
Binder, Magazine.....H. B. Collins
Bird-cage.....J. E. Compton
Blower.....J. J. Stoeker
Bobbin-holder and yarn-catcher, Combined.....W. C. Boswell
Boiler.....H. S. Martin
Boiler or heater.....J. H. Paton
Boiler furnace, Steam.....H. A. Poppenhusen et al
Bolt and nut.....J. A. Ludlow
Bolting-machine, Centrifugal.....I. A. Chavanne et al
Book-clasp.....C. L. Bauldauf
Booklet, Loose-leaf.....L. F. Smith
Bottle.....F. McCarron
Bottle-filling machine.....J. Nader
Bottle, Non-refillable.....H. C. Niederee
Box-vending machine.....J. P. Bird
Box folding and gluing machines, Automatic stacker and counter for....H. F. Teetsell
Box-lifter.....A. F. Dehn
Brake attachment, Vehicle..W. W. Walton
Brake mechanism for self-acting mules, Backing-off.....J. G. Bodemer
Brake-rigging.....W. H. Sauvage
Brake-shoe.....H. Jones
Brake-shoe, Interlocking.....H. Jones
Brake-shoes, Molding and casting reinforced.....D. Rawstron
Bread-molding machine.....J. A. Sexauer
Broom and brush cloth-holder..C. B. Davis
Brush and polisher, Renewable shoe.....E. Wilson
Brush, Dahhling.....F. H. Hardy
Bucket-handle, Tipping.....A. T. McCanlis
Buckle.....J. A. Wheeler, Jr.
Burner attachment.....C. Miedel
Cabinet, Lace.....T. H. Morgan et al
Cabinet, Store.....J. W. Burrows
Cable-roller.....S. Haverly
Calculating-machine.....I. Moe
Cameras, Automatic shutter-controlling mechanism for.....S. Roesner
Can.....J. S. Stevens
Can-opener.....C. Abbott
Can-opener.....A. A. West
Cap.....G. A. Mondorf
Car brake, Railway.....A. Camphell
Car brake, Railway.....G. C. Thompson
Car-derailing device..C. W. Reinoehl et al
Car door, Freight.....T. W. Heintzelman
Car driving-gear, Motor.....P. Daimler
Car, Dumping.....B. L. Newell
Car, Gravel dump..2 pats.....A. Camphell
Car, Passenger.....P. N. Jones
Car underframe, Railway.....H. S. Hart
Car-ventilator.....A. Best
Cars and other conveyances, Appliance for railway.....H. T. Cronk
Carbureter.....J. Peterson
Carbureter.....J. R. Mack
Carbureter.....J. M. Kelley
Carbureter.....C. Fox
Carbureter-heater.....C. Fox
Card or ticket holder.....F. F. Schmidt
Carton-machine.....E. M. Gilfillan et al
Cartridge.....G. Loeble
Cash-box.....H. Hirt
Cash-register.....C. A. Lundgren
Cask or barrel, Metal.....J. J. Wolf
Casket, Burial.....A. R. Lerro
Casting-machine.....F. A. Carter
Castings, Introducing modifying elements into.....F. G. Wright
Catch, Safety.....R. Willard
Cement-block machine.....F. H. Huber
Cement-block mold.....T. H. Kruse
Cement-block mold.....F. H. Huber
Cement, Composition of matter to be used for making acid-proof.....H. Kayser
Centering-form, Sectional metallic.....H. Besser
Cereals, Bleaching and aging.....J. M. Williams
Chain, Conveyer.....J. McLauchlin et al
Chain-link.....E. J. Reinhart et al
Chalk-line reel.....J. C. F. Whitmore
Change-making device.....L. J. Dittmar
Chimney-top.....E. Newman
Chuck.....W. E. Anderson
Chuck, Drill.....H. W. Fuller
Cigar-holder for hats.....F. E. Clark
Cigar tip-cutter and lighter..H. F. Lichty
Cigar-wrapper cutting and rolling machine.....B. A. Williams
Cigarettes, cigars or tobacco, Box for....C. Campus
Circuit-breaker.....E. A. Burrows et al
Clamp.....K. B. Faris et al
Cliuometer, Spirit-level.....L. Bergh
Clip.....E. Hahn
Clock.....E. E. Dungan et al
Clock, Alarm.....A. Kaiserman
Clock, Alarm.....A. Y. Jansen
Clothes-tree, Collapsible.....W. J. Hegarty
Clothes-washer.....W. B. MacLean
Coal-separator, Centrifugal.....N. Mowery
Coatings, Producing permanent insoluble, incombustible and washable.....A. Sala
Coats, Making.....C. J. Larkin
Cock, Gage.....J. Stockwell
Coin-holder.....C. A. Lundgren
Collar-fastener.....J. E. Crothers
Collar neck-pad, Metallic harness.....F. Slocum
Collar-stuffing machine, Horse.....J. C. Collett
Columns, Tie-strip for porch....P. Kosack
Compacting machine.....W. H. Bowman
Computing-machines and the like, Ribbon-feed mechanism for.....D. W. Shick
Concrete tiles, Making decorated.....F. J. Sterner et al
Concrete vault.....W. Pugh
Condiment-shaker.....J. D. Kinsley
Corn-husker.....H. A. Schermerhorn
Corn rake and elevating machine.....R. G. Jenny
Cot, bunk, couch and the like for use on shipboard, Self-leveling...A. L. Wertheim
Cover.....F. E. Teves
Crate, Collapsible.....A. Buchalka
Crate, Folding.....E. C. Rose
Crate, Folding poultry.....T. Murray
Cultivator seed-sowing attachment.....R. Griswold
Current-interrupting device....O. M. Leich
Curtain-pole.....J. H. Boyd
Curtain, screeu and the like, Window.....W. B. Knapp
Cushion.....F. Greer
Cuspidor.....C. A. Wagner
Cuspidor.....A. Toward
Cuspidor.....G. Laimer
Cuspidor.....E. Johnson
Dental waste-receiver.....J. J. Moffitt
Derrick.....A. P. Haid
Derrick fountain..M. R. and M. J. Zahniser
Die-stock, Adjustable.....F. G. Koehler
Distributing system.....C. M. Dissosway
Dog-ear cutter.....F. W. Porter
Door.....J. C. Dunn
Door.....A. H. Schlueter
Door, Combined screen and storm.....C. W. Kohl
Door hanger, Barn.....F. M. Yentzer
Door-holder.....C. F. Link
Draft-equalizer.....W. Schoenecker
Draft-evener.....G. E. Koehler
Draft rigging, Combined friction and spring.....W. D. Lowry
Dredge-bucket.....W. J. Moore
Drill and valve-grinder, Combination.....F. C. Blanchard
Drinking-cup.....R. A. Hoar
Drum, Heating.....J. H. Bicksler
Drying apparatus.....P. M. Velilla
Drying apparatus, Electrical.....G. W. Richardson
Dust-collector.....A. S. Wolf
Dust-collector.....V. T. Johnson et al
Dye and making same, Red halogenized....A. Schmidt et al
Dye, Azo.....W. Bergdolt
Educational appliance.....R. F. Smith
Egg-beater.....A. Mattern
Egg-beater.....A. H. Otten
Egg-case.....J. A. Johnson et al
Electric apparatus, Protective device for..F. W. Harris
Electric-circuit-controlling means.....J. K. Lux
Electric-circuit interrupter....F. W. Harris
Electric-control system.....W. M. Chubb
Electric heater.....C. D. Haskins
Electric switch.....J. L. Creveling
Electric time-switch.....J. De Lorenzo
Electrical tool, Portable..E. J. Backscheider
Electricity, Apparatus for thermochemical generation of.....L. P. Basset
Electrodes, Protective device for.....T. Sahrig
Electromagnet-coil.....C. B. Larzelere
Electromagnetic circuit-controller.....H. G. Geissinger
Electroplating.....T. A. Edison
Electroplating apparatus, Dipping mechanism for.....J. H. Shaw
Engine muffler, Explosive.....D. B. Smith
Engine starting mechanism, Internal-combustion.....L. Yost
Envelop.....W. E. Gilmore
Envelop-loading machine.....J. R. Williams et al
Etching-machine.....A. R. Smith et al
Evaporating apparatus.....C. W. Zastrow
Evaporator, Soda-lye.....C. P. Carlson
Eye-cup.....W. J. O'Neill
Eyeglass-mount.....L. E. Grant et al
Eyeglass or spectacle lens clamp.....S. Beauchamp
Fabric laying and folding machine.....M. L. and C. M. Shapera
Fabric-stretching machine.....F. Chatfield
Fan, Oscillating.....R. E. Barker
Fastening device.....H. A. Farrand
Fastening device for doors and the like....C. J. Johnson
Faucet.....V. Retisky
Feather plume.....D. Metzger
Feeder, Automatic animal.....C. Caspari
Feeder, Poultry.....C. N. Whitney
Feeding device.....G. W. Swift, Jr.
Fence.....T. M. Hart
Fence-posts and the like, Mold for forming.....Q. G. Sheldon
Fertilizer.....A. Frank et al
File, Document.....G. Mott
File for accounts.....W. B. Mitchell
Filing-case.....D. F. Greenawalt
Filter-stones, Cleaning and sterilizing....H. Jarvis
Fire-alarm system.....W. Carroll
Fire-box.....J. M. McClellon
Fire-extinguisher.....T. P. McCall
Firearm or rifle, Repeating.....N. Giusto et al
Firearm, Tubular magazine....W. Bennett
Fireproof stair.....H. F. Edwards et al
Fish-spear.....J. J. Bjornseth
Flagstaff.....W. E. Lombard
Floor-clamp.....A. A. Oliver
Flow-regulator.....T. Larsson
Flower-pot.....E. J. Aul
Flush-tanks, Operating-lever for low-down.....J. W. Blakemore
Flushing-tank.....G. H. Bailey
Fly-paper holder.....C. F. Stoner et al
Fob, Key-ring.....H. O. Fowler
Folding table, Portable.....S. Cerriel
Foot and ankle-joint, Artificial..E. Mueller
Foot-arch, Device for obtaining a mold of the.....J. H. Morton et al
Forge, Automatically-operated.....J. H. Dickey et al
Fruit-picker.....W. A. Johnson
Furnace-grate, Hollow metal..T. J. Walton
Furniture-tip.....A. B. Diss
Fuse-cap, Waterproof.....T. M. Daniels
Galvanic battery.....S. Benko
Game apparatus.....E. A. Festerling
Game apparatus.....R. F. Downey
Game apparatus.....M. H. Kane et al
Gang-plank, Folding.....E. J. Miller
Garment-hanger.....H. B. Douglas
Garment-hanger.....S. T. Watanabe
Gases from a furnace for firing further furnaces, Utilizing spent fire..H. Uihlein
Gases in drying operations, Apparatus and process for controlling humidity of.....H. D. Tiemann
Gasolene-engine.....C. C. Jones
Gate.....N. Williams
Gate fastener, Wire-fence..A. N. Sandquist
Gear, Reversing.....F. J. Bradberry
Gearing, Planet.....P. H. Peters
Gearing, Speed-changing.....A. Astrup

Gearing, Transmission.....C. A. Ward
Gearings, Loeking device for differential..
.....W. L. Burnam
Generator apparatus.....O. M. Leich
Glass artieles, Machine for the automatie manufeture of blown.....C. Barrez
Glass, Method of and apparatus for drawing.....R. L. Frink
Gluing dowel-doors, Machine for.....
.....C. G. Dauher
Grain-drill hopper.....A. H. Hadley
Grain-handling maehiue.....J. White et al
Grain-separator.....R. L. Owens
Graining-machine.....G. A. Carlson
Grease eartridge or eontainer.....
.....R. V. Whitaker, Jr.
Grinding-machine.....A. C. Warner
Grinding-mill.....G. S. Emeriek
Grinding-roll.....J. Deelen
Gnmming or pasting maehine.....
.....W. F. Strehler
Gun, Gopher.....F. M. Austin
Gnn safety-loek.....G. E. Heekman
Gnn, Take-down.....F. F. Knous
Gnn, Vaporie-steam.....G. W. Browne
Haloids, Making.....J. C. Graves et al
Haumer attaehment, Pneumatie.....
.....C. McSherry
Hammock and streteher or spreader therefor.....I. E. Palmer
Handwriting, Device for mechanical aid for
.....W. S. Twitchell
Harness attaehment.....J. W. Van Every
Harrow-tooth, Adjustable.....A. Brigden
Harvester, Beet.....A. Clark
Harvesters, mowing-maehines, &c., Cutting mechanism for.....J. Hebden
Hat-hanger.....E. F. Kandlhinder
Hay-cocking machine.....G. W. Latta
Hay-sling.....H. P. Hanson
Headlight.....C. J. Feiker
Heat of clinker withdrawn from refuse-destructors, &e., Means for utilizing the
.....H. N. Leask
Heater.....C. H. Hook
Heating apparatus.....J. M. W. Kitcheu
Heating-furnace for sheet metal.....
.....L. C. Steele
Hinge, Spring.....A. S. Nero
Hoisting mechanism.....M. S. Yoder
Horizon-gage.....J. P. Tapley
Horse-power.....J. W. Broomhall
Horseshoe.....J. Lazarus
Honse-cooling and lawn-sprinkling device..
.....W. A. Crawford-Frost
Humidifying apparatus for dwelling-houses
.....A. W. Thompson
Hydranlic elevator, Pluuger.....T. Larsson
Hydrocarbon-burner.....A. C. Williams
Hydrocarbon-burner.....W. N. Best, Jr.
Hydrocarbon-burning apparatus, Liquid...
.....L. K. Leahy
Hydrogen from water-gas, Prodncing.....
.....A. Frank
Ice and snow from the third rails of electric railways, Apparatus for elearing.....
.....A. J. Simon
Ice-eream disher.....E. A. Erickson
Ice-cutting machine.....E. Hatton
Ice protecting aud preserving means.....
.....E. M. Boynton
Ice-tool.....P. Robarge
Ignition apparatus.....A. E. England
Incandescent-mantle support, Inverted.....
.....J. T. Lister
Incubator.....A. Essig
Ingot-stripper.....C. L. Taylor
Insecticide.....E. Olsson
Insulated joint.....G. Wright
Insulator-support.....J. Blackburn
Interleaving mechanism....W. L. Saunders
Internal-combustion engine.....H. Eason
Intesines, Apparatus for treating and measuring.....H. Eberhardt
Jewelry.....L. E. Garrigus
Journal-boxes, Roll-cage for closed.....
.....C. S. Lockwood
Junction-box.....J. R. Duff
Kinetoscope.....G. W. Bingham
Knitted fabric..2 pats.....H. A. Carter
Ladder, Extension step....C. W. Spanlding
Lamp, Adjustable.....A. S. Lyhne
Lamp, Electric arc.....T. E. Adams
Lamp-filament.....W. D. Coolidge
Lamp filaments, Making incandescent-electric.....W. G. Clark
Lamp-holding socket, Electric.....
.....H. W. Lawrence
Lamp-shade holder, Electric.....G. Habig
Lamps, Mannfacture of incandescent electric.....D. J. O'Brien
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Lantern-globe lifter.....F. L. Walker
Lantern slide-carrier, Magic..L. L. Welsh
Lard-press.....E. Harman
Latch, Door.....A. M. Hoes
Latch, Gate.....H. B. Crowell
Lathes, Self-clearing segment for.....
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Lawn-sprinkler.....A. F. Saltlamachia
Leaf-turner.....J. and E. Dolar et al
Leather-cutting machine.....J. Schwaber
Lectnrer's reading-box...F. W. Prince et al
Level and angle-finder, Gravity.....
.....G. H. Sprenkle
Level, Spirit.....S. L. Stratton
Lifting-jack.....E. L. Coddington
Lightning-rod construction....T. Thompson
Lightning-rod upright.....G. J. Moore
Limb, Artificial.....E. Mueller
Line-holder.....I. B. Turner
Loading apparatus.....F. M. Arnold
Lock.....E. B. Stone
Lock.....A. W. Dowe
Lock-hook.....A. Stridell et al
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Looms, Contrivance for the tension of weft-wire with wire-gage.....O. Elibauer
Looms for weaving, Dobby for.....
.....E. Hollingsworth
Lozenge-making maehiue.....F. A. Meier
Lubricator.....G. E. Ledgerwood
Lubricator.....A. J. Oaks
Machine-tool holder.....R. E. Colton
Magnet, Rotary field.....E. Colkers
Mail-bag deliverer.....M. N. George
Mail-box.....J. H. Mills
Magnetos to operate with two-eylinder gas-engines set V-shaped, Deviee for timing
.....T. M. Mueller
Mantle-making process.....C. M. Lungren
Mantle-tying apparatus.....E. Skriwan
Manure-spreader, Attachable....J. J. Howd
Maps and other articles, Sectional board for supporting.....F. E. Suedeker
Marker, Land.....H. S. Kellauder
Match-striker.....A. Kinowski
Matte, Handling.....W. D. Kilbourn
Measuring instrument....I. B. Hagau, Sr.
Measuring instrument, Elecetrieity.....
.....J. Goruer
Metals dense in liqnid state, Means for making.....W. B. Bary
Metallie silicids, Manufaeture of.....
.....G. Strauss
Microphonie transmitter...C. L. Chrisholm
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Scraper and grader, Road....J. Van Matre
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Looms, Pick-matcher for automatic weft-replenishiug.....A. E. Rhoades
Looms, Pick-matchiug mechanism for automatic weft-replenishing....C. H. Draper
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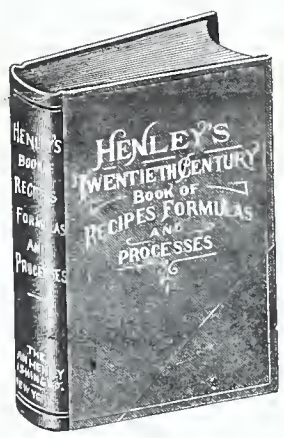

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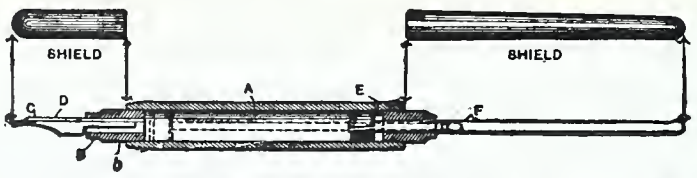

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NEW ORDNANCE FOR ATTACKING BALLOONS AND AEROPLANES.

By C. VAN LANGENDONCK.

THE recent performances by airships, balloons and aeroplanes in France, Germany and the United States, are offering striking testimony to the practicability of aerial navigation. There is no reason why dirigible balloons should not, in the near future, be able to carry large quantities of explosives for attacking armies, forts, towns, dockyards, etc. Consideration of the problems of defense by ordnance against attack by aerial ships is justified. Suitable batteries of airships attacking guns may have to be provided, which would engage the enemy at one or two miles range, so that it would be in danger zones for a considerable time.

The design and construction of guns for these purposes are already exercising the ingenuity of the mechanic and metallurgist. The well-known Krupp firm has especially examined the problem, and we are indebted to it for the accompanying illustrations.

It is known that the Zeppelin airship has attained a height of 5872 feet (about 1⅛ miles), so that to reach it, high-velocity guns would be required. The velocity of transmission is nearly 20 yards per second, and it would be necessary to arrange to train a gun for defence against attacks of such an air vessel at the rate of a half degree per second, at a distance of about 6000 yards. The angle of elevation required is at least 60 degrees, but this condition is also easily met. The sighting of such guns, however, introduces a new problem. This can be easily understood when we think of the ordinary land service guns which are directed against a target confined to the horizontal plane. Even if moving its movements are restricted to what is practically a horizontal plane, whereas in the case of an airship not only does the total range alter, but the altitude is also subjected to a very rapid change. This difficulty has been successfully arranged for in the Krupp gun. There is also the question of weight and design of projectile to ensure the greatest area of destructive effect.

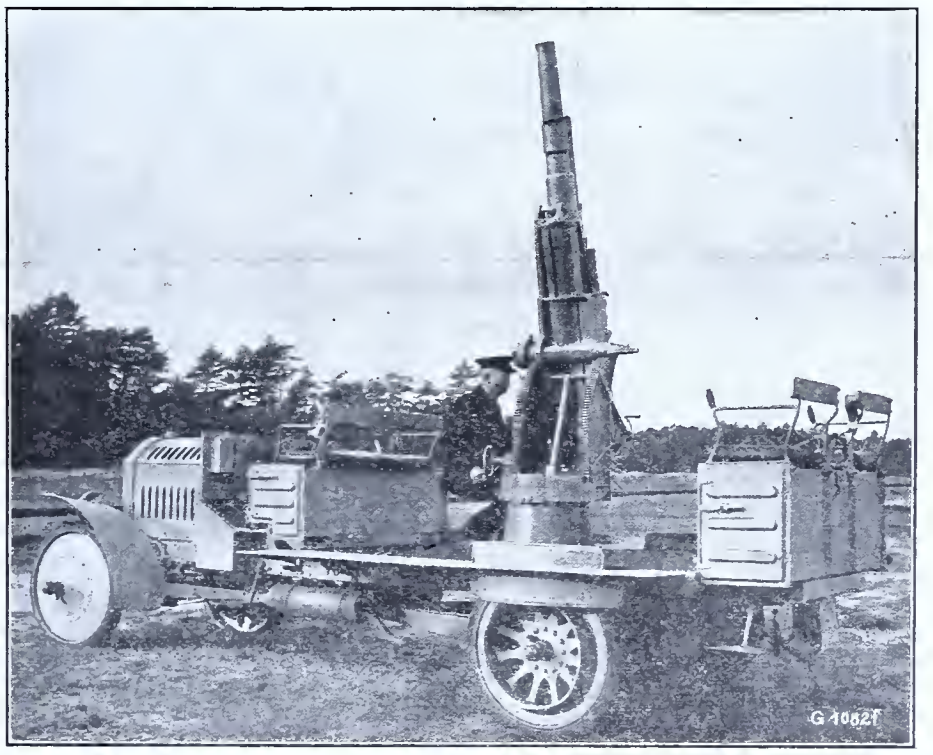

FIG. 1.—AIRSHIP ATTACKING GUN.

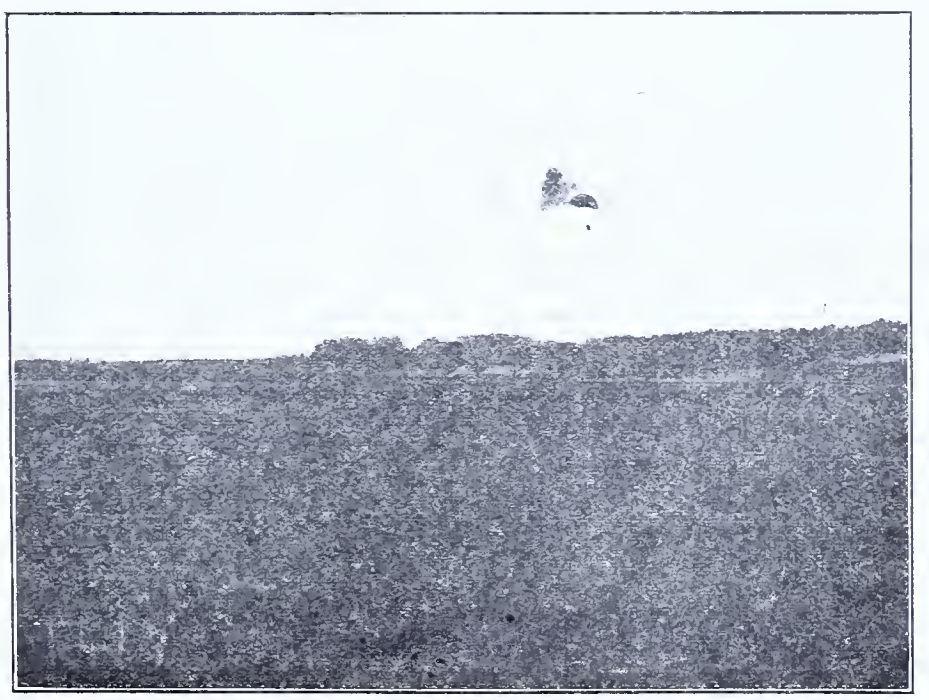

FIG. 2.—BALLOON BEING DESTROYED BY AIRSHIP ATTACKING GUN.

The Krupp firm proposes three types of guns, one of which is illustrated in Figure 1. This gun, which may be elevated to 60 degrees, fires an 8.8 pound projectile at a velocity of 2035 feet per second, giving a range of 10,400 yards at 45 degrees elevation. The trunnions are arranged quite close to, and almost below, the breach, with the balancing arrangement forward to maintain the equilibrium. The wheel axles are hinged with a removable pin joint, and can be turned forward until their extended axes cross each other beyond the end of the spade. The gun may be trained round a pivot on the carriage.

The elevation is by pinion and quadrant. The recoil buffer and running-out spring and breach mechanism and safety gear, are of the usual Krupp type for field guns. A telescopic sight is, of course, indispensable. The man operating the sight sets it to the elevation, making allowance for drift and inclination of the axis of the carriage, and also observes the direction of the shot. The determination of the range and the corresponding angle of elevation is done by means of a range-finder. The range-finder is arranged to give the elevation corresponding to a given range and altitude. The relations between the range and the altitude are represented on a drum by a series of curves. This drum is mounted on the frame of the range-finder, so that when the eye-piece is directed on the target the drum is rotated to a degree corresponding to the altitude.

Rapid mobility is absolutely essential for defence against airships, and interest attaches to the Krupp automobile carriage for the high-angle gun, shown in the cut.

The type of projectile required calls

for careful consideration. A shrapnel shell normally showers destruction, but it remains to be seen whether the perforations of gold-beaters' skin by the bullets would cause serious damage to the balloon. Such a projectile would seriously affect the light-propelling mechanism. A percussion fuse would be ineffectual, and a time fuse involves possibilities of great inaccuracies. A promising suggestion is to fit the projectile with what the Americans call a "tracer" at the base of the shell. When the projectile leaves the gun, a hot flame is lighted, burning like a bright star during flight, and igniting the hydrogen or other gases in the balloon. Krupp used, at the trials, a tracer, exuding smoke to mark the trajectory of the projectile.

Keeping Warm With Ice.

To keep from freezing by the use of ice seems a novel way of turning ordinary usage upside down. Yet a Government has devised such a peculiar method of heating. It consists in keeping out cold, not by the use of fire but by the intervention of ice.

A car, double lined, is fitted at each end with four galvanized iron cylinders reaching from the floor almost to the top. In summer these cylinders are filled with ice and salt in order to keep the car cold. The remarkable point, however, is that in winter they are filled with ice to keep the contents of the car from freezing. Ice is normally at a temperature of 32 degrees F., and it is a substance that changes its temperature reluctantly, being a bad conductor of heat or cold. Consequently, when zero weather prevails without, the cylinders of relatively warm ice prevent the escape of heat; in other words, they maintain the temperature within the car.

Another device whereby ice is employed for protection against cold consists in throwing on the car when the weather is near the zero point, a plentiful stream of water, which freezes at once and forms a complete coat over the vehicle. The action of the ice is the same as in the other case. A similar plan is frequently adopted in the transportation of bananas, a fruit which is particularly susceptible to cold. The fruit is put in paper bags inside of heavy canvas sacks, and covered with salt hay when the temperature is dangerously low.

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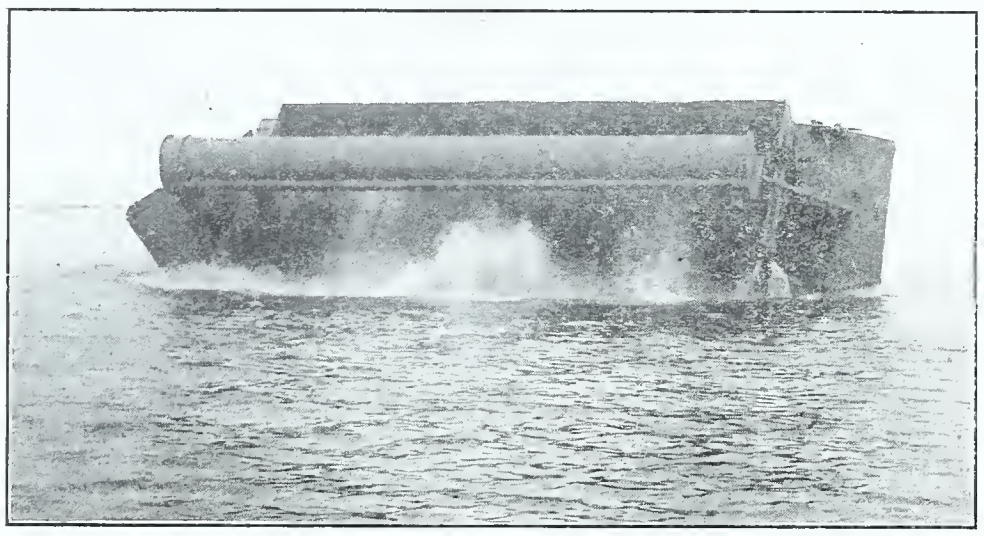
SELF-DUMPING BARGE.

A most interesting method of dumping stone, etc., has recently been adopted at Stockholm, Sweden. A large amount of rock blasting is being done in the harbor extension work, and until recently the ordinary hopper type of barge with doors in the bottom was employed. A Swedish Engineer, A. F. Wiking, devised the automatic dumping barge shown in the accompanying illustrations. It will be noted that it has a flush deck with low bulwarks on three sides, the fourth or dumping side being left open.



SELF DUMPING BARGE IN OPERATION.

As will be seen from the drawings, the automatic tilting of this barge is accomplished by forcing water into a cylindrical tank, mounted on tripods 16 feet above the deck, by means of compressed air. On account of the location of this tank, the stability of the barge is upset by the admission of water to the tank, resulting in the tilting of the barge and the discharge of its load.

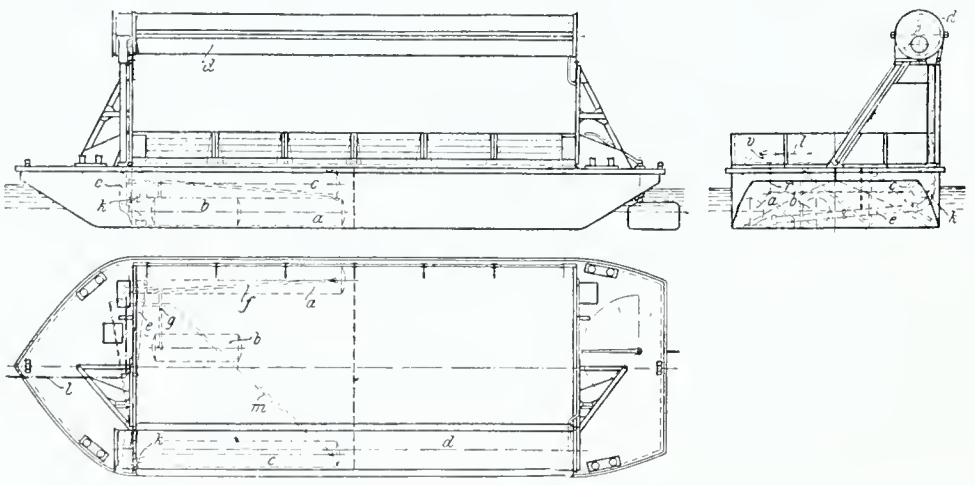


DIAGRAM OF BARGE.

Four cylinders or tanks are provided, as indicated at *a*, *b*, *c*, and *d*, two being provided with water, while *e*, contains compressed air. The first tank is located below the deck, with a pipe connected to the upper tank *d*, and by means of a special arrangement of valves, the compressed air is admitted from tank *b* to tank *a*, forcing the water into the upper tank *d* and destroying the stability of the barge so that it tips over until the load slides off into the water. The connection with the air tank is closed after the load has been discharged, and tank *a* is opened to the atmosphere, allowing the water to flow back into the lower tank. The barge then takes an upright position again.

A pressure of seven atmospheres is utilized in tank *b*, which is charged with compressed air by coupling a hose to the top of the valve chest. For every 200 tons of load on the deck of this self-dumping barge, the tank *a* requires about 6 tons of water. The introduction of the intermediate tank *c* was made necessary by the fact that in some instances, owing to the nature of the load, dumping does not occur until the tank *b* is at or near the surface of the water, and as the level of *d* would be below the tank *a*, the water would not flow into the latter and right the barge.

The water is allowed by the proper operation of the valves to flow first into tank *c*, which is always lower than tank *d*, and as the barge begins to return to an even keel, the water flows into tank *a* and the barge then takes an upright position. This barge is said to work most satisfactorily, and on account of its unique construction is of special interest to American engineers.

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Magic Glass.

One of the most curious inventions of this age is what is called platinized glass. A piece of glass is coated with an exceedingly thin layer of a liquid charged with platinum, and then raised to a red heat. The platinum becomes united to the glass in such a way as to form an odd kind of mirror. The glass has not really lost its transparency, and yet if one places it against a wall and looks at it, he sees his image as in an ordinary looking glass. But when light is allowed to come through the glass from the other side, as when it is placed in a window, it appears perfectly transparent like ordinary glass.

By constructing a window of platinized glass, one can stand close behind the panes in an unlighted room and behold clearly everything going on outside, while passers-by looking at the window behold only a fine mirror, in which their own figures are reflected, the person inside remaining invisible.

In France various tricks have been contrived with this aid of this glass. In one a person, seeing what appears to be an ordinary mirror, approaches it to gaze upon himself. A sudden change in the mechanism sends light through the glass from the back, whereupon it instantly becomes transparent, and the startled spectator finds himself confronted by some grotesque figure that had been hidden behind the magic glass.

Moving Picture Targets.

The latest target idea in Europe is a moving picture figure which appears in the open with gun in hand and fires back on the marksman firing at it. The practicing marksman holds his rifle in readiness to fire the moment the figure appears on the screen, but if the flash of the gun held by the moving picture figure, which is pointed directly at the spot where the marksman stands, is seen before the marksman fires, the latter is theoretically dead. Or should he fire and miss the pictured figure, he is numbered among the dead. The hits of the marksman are recorded by an automatic signal. The target requires not only accurate shooting but rapid shooting, and much resembles a battle in which opposing sharp shooters are trying to pick each other off.

Concrete Organ.

The great new organ in the auditorium at Ocean Grove, N. J., said to be the most remarkable in the world, is made largely of concrete, this material having replaced the wood usually employed. The chambers and passages for the compressed air, the four or five chambers for the pipes, and the larger of the pipes themselves are of concrete. The method of furnishing air to the organ is also novel. There are no bellows or moving wind reservoirs, but the air itself is compressed by electric motors, and the wind chests and pipes are in direct communication with the chambers, so that a perfectly even supply of air is at all times available. The unusually fine tone of the instrument is ascribed to these new features.

Sermons by Telephone.

Gradually the rural telephone has grown from a fence post affair to a thing of daily convenience. It is now entering a field unusual and yet useful, for it is becoming the disseminator of the Sunday sermon. No more the farmer's wife who lives three miles from church need worry as to whether the weather will be too bad for the long drive. The telephone has stepped in and brought the church to the home. It is in Olathe, Kansas, that the experiment of the telephoned sermon is being tried, and so far it has been a success that is growing. All of the service is transmitted directly to the home, and all one need to do is to place the phone transmitter to the ear. Three churches are using the service now. In two it is employed for the old and ill, but in the other the service is adapted to general practice. Each of the churches is fitted with a transmitter containing an extremely sensitive microphone arrangement and provided with special batteries and coils. The transmitter is no larger than the ordinary one used in telephone exchanges, and hangs suspended from a rod in front of the pulpit, without obscuring the congregation's view of the minister. As the sermon is delivered the transmitter takes the tones and carries them over the wires to the various listeners. The manager of the telephone company says that a constantly growing number of the company's patrons use this service on Sunday, and this raises the question as to what will be the effect on the churches should this system come into general use. Will the preacher of the future sit in his study and "preach" his sermon before an electrophone, as the device is called, while the congregation sit at home in easy chairs, with telephone receivers at their ears?

Speeches, also, are being transmitted in this way. At an Associated Press banquet in New York last spring, a speech was delivered by Andrew Carnegie, although the latter happened at the time to be in Washington. When the master of ceremonies came to the proper place in the program, instead of the stereotyped phrase of introduction, he said "We have not with us tonight Mr. Carnegie, but we will now hear from him." And each of the guests picked up a telephone receiver in front of his plate, placed it to his ear, and heard the speech.

But the greatest novelty in this line is holding court over the phone. A case of theft was recently tried in this way in Indiana. The judge was quarantined because of scarlet fever in his home. In order to prevent the law's delay, the various parties to the case were connected by phone, the evidence heard, and the sentence (sixty days) imposed.

Fireworks to Scare Crows.

The great grain fields in Shasta County, California, are ingeniously protected at night from the vast flocks of wild geese and other aquatic fowl that do immense damage to crops, by means of a display of fireworks. Skyrockets and Roman candles were bought in large quantities by the managers of the ranch, and men are stationed at various points. Whenever a flock is heard "honking" in the distance, several skyrockets or a shower of colored balls from a Roman candle are sent upward, with the result that the birds give the place a wide berth.

A CONCRETE BARN.

CONCRETE has long been recognized as the ideal material for streets, and more recently for houses and bridges, and for a variety of other uses, the range extending from culverts and tunnels to fence posts and railway ties. The progresive farmer now makes his silos of this cheap, durable and adaptable liquid stone. It has remained for an up-to-date Indiana man, however, to carry its employment a step farther, and construct a concrete barn. So novel is the plan of this building, and so superior in many respects, that a detailed description, with illustration, is given.

It will be noted that the barn is unusual in shape, being almost circular.

It is in fact twelve sided, or a dodecagon sixty feet in diameter, each side being sixteen feet long, which makes the outside of the walls measure ninety-two feet. These walls are made of solid cement thirty feet high above the ground floor and are re-enforced with 118 rods of heavy wire fencing, placed in the middle of the wall. At the sides of doors and windows and above them the walls are further re-enforced with old iron, mostly bridge iron. The bridge beams imbedded in the walls at the sides of, and above, the doors, have heavy wire wrapped around them to hold the cement more securely. The wooden door and window frames are specially designed to be taken out after the cement has hardened. The walls taper from 12 inches in thickness at the base to 8 at the top.

The timbers of the second, or main, floor are supported by sixteen tubular iron columns, six inches in diameter and filled with cement. This floor is nearly nine feet above the ground floor and is double boarded with inch boards with tar paper between. Above this floor is a frame of timbers across the barn, making one open passage or threshing floor, 12 feet high and 12 wide, and another on the right of it 19 feet wide and 7 high. This space is covered above with a floor, an opening being left next the doors to draw up hay. In building the wall, forms of three 2 x 10 inch hemlock planks were used, fastened together by cleats and held in place by removable bolts.

The barn is fifty-three feet high from the ground floor to the opening in the roof over which the ventilator cupola is built. Iron rims of old binder wheels were put in for the ventilator outlet, and the upper end of the long rafters were bolted to these rims. The lower king rafters are twenty feet long and the upper ones eighteen. The rafters are 2 x 3 inch timber, and are spliced at the hip by pieces eight by ten feet long. The pitch of the roof below the hip is 15 feet rise to twelve feet run, and above the hip five to twelve. The plate that holds up the lower end of the rafters is built up of five thicknesses of 2 x 12 inch plank of hard lumber, well interlocked at the corners by some extra interlocking planks six feet long, put in the plate across the corners. It is all well spiked and bolted so as to hold the outward thrust of the self-supporting roof.

There are 31 windows in the barn, all of the same size, 20 x 12 glass with four lights to each sash. The lower windows have double glass, and all are protected, inside and outside, by heavy wire screens. There are no window and door frames in the walls to rot out. The window sash fits in the cement and is held there by common window bolts, which fasten into small oak blocks in the cement. The doors are hung on rollers, holes for the bolts being provided when the wall was built. Boxes of light material that could be knocked out afterwards were also placed in the wall when it was built, to provide sockets of correct size in which now rest the ends of joists and joist bearers.

The ground floor of the barn is all cemented and has a drive way through the center with a row of stalls and mangers on each side, so arranged that the stock stand with their hind feet lined up to shallow gutters on each side of the driveway. This plan practically puts two stables in one, giving room for handling manure, watering stock, and taking teams out of the stable.

The feed racks are eighteen inches above the floor for horses and twelve inches for cattle. There are cross bars lengthwise of the mangers through which the stock gets the hay. The arrangement is such that the stock can lie down where they stand while eating without stepping back. There is a hydrant on the ground floor for watering the stock, and waste water is flushed out. The woodwork about the stalls is low, so that it will not obstruct the light or the view over the entire basement. Two feeding alleys run outside of the double row of stalls, and the irregular space between these alleys and the outer walls is used for box stalls and calf pens.

Lids that slide horizontally on rollers are fitted under the floor at the opening of the hay chutes to close them in cold weather. They can be operated from any point along the chutes to the roof, by double cords running on pulleys. There are six inlet ventilators, each made of two elbows and a joint of pipe placed upright in the wall, and one outlet ventilator.

A round hay track, thirty feet in diameter, is put under the roof, and is fitted with a carrying outfit that hoists the hay to any height and runs to either side without track stop or change of ropes. A gasoline engine operates this, but it could be run by horse power. The engine was used in the heavy work of mixing and lifting concrete and elevating lumber.

The builder and owner of this barn estimates the cost at $1780, besides his own work. He hauled the gravel, one hundred and fifty loads being necessary. About three hundred barrels of cement were used. The construction has much in the way of durability, cleanliness, safety, and convenience to recommend it.

Discharged from Imitation Gun.

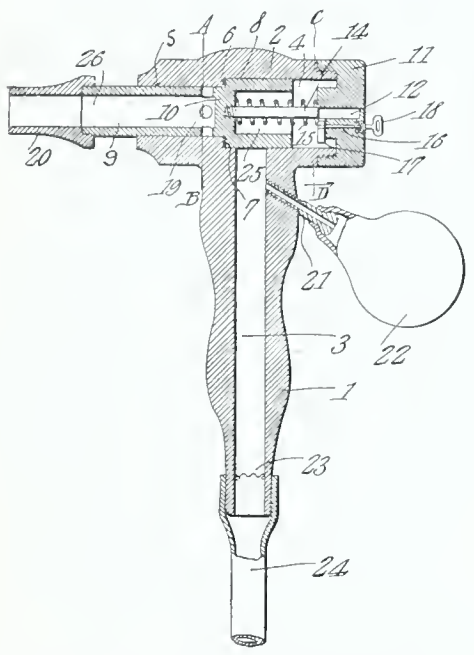
One of the latest amusement devices provides pleasure seekers with the sensation of being discharged from a huge cannon into space. The body of the device has the shape of a coast defense gun, and is 138 feet long and 18 feet high. The projectile, in which 50 persons can be seated, is slid into the breech and a mechanical concussion occurs. Then follows the sensation of being shot into the far beyond. A moving picture device, rapidly moving curtains of clouds on both sides and the constant movement of the projectile, produce the appropriate sensations.

CLEVER NEW PATENTS.

Faucet Closing Device.—Concrete Mold.—Cutter for Well Pump Cables.

Faucet Closing Device.

A simple and inexpensive, and at the same time, effective device for the above purpose has been patented by Alexander E. Redlich, Chicago, Ill. It is adapted to be used to fill bottles, jugs, etc., either from a cock, where there is constant pressure, or from the bung hole of a barrel, when the contents must be siphoned out. The shank of the device, as shown in the longitudinal section illustrated, is

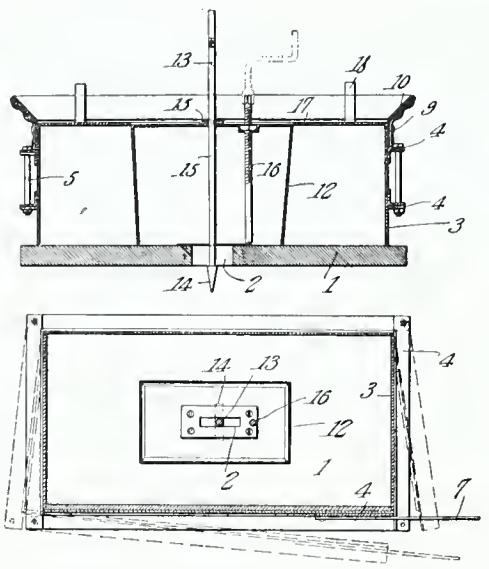


tubular, as is also the head, the bore of the shank communicating with a chamber in the head, and the chamber being provided with a shoulder 6. A valve slides in the head, and its neck 9 fits the chamber and protrudes beyond the head. Intermediate the body wall 10 of the valve and the end of the neck are openings 19 in the neck, which are closed by the head 2. One end of the head is closed by a threaded cap, in which is adapted to reciprocate one end of a spindle 14, the other end of which is rigidly mounted in the wall 10. Coiled around the spindle is a compression spring, one end bearing on the wall 10 and the other on the face of the cap 11. The latter has an opening to one side of the channel, in which is journaled a shaft 16 with a head 17, so positioned that when the shaft rotates the head extends into the channel and prevents the spindle from reciprocating in the channel, the valve being locked in closed position by the operation. The end of the shaft protrudes through the wall of the cap 11, and into the seat thus formed may be introduced a key which will serve to lock the valve in position. A nozzle 20 is mounted on the end of the neck, and a tube 21 passes through the wall of the shank and at its outer end has a bulb 22. Within the bore of the shank is a screen 23, and at the end of the shank is a flexible tube 24. These act the part of a siphon, when necessary. When the liquid traverses this tube and the bore, it will be held in check by the body of the valve. When the nozzle is introduced into a bottle neck, the valve will be slid inward and the spring compressed. This causes the body to recede from the shoulder 6, the openings 19 being moved beyond said shoulder. This establishes a continuous passage through the tube, the bore of the faucet and the bore of the neck of the valve. When the faucet is lifted to free the nozzle from the neck of the bottle, the spring causes the valve to move into abutment with the shoulder, which stops the flow of the liquid. Not only does the side wall of the body of the valve extend across the bore of the shank, but the end of the body bears on the shoulder, so that the liquid is doubly secured against leakage.

To prevent children tampering with the device, the key 18 may be made to engage the end of the shaft, whereby the latter may be rotated, causing the head 17 to extend into the channel of the cap and locking the valve closed.

Concrete Mold.

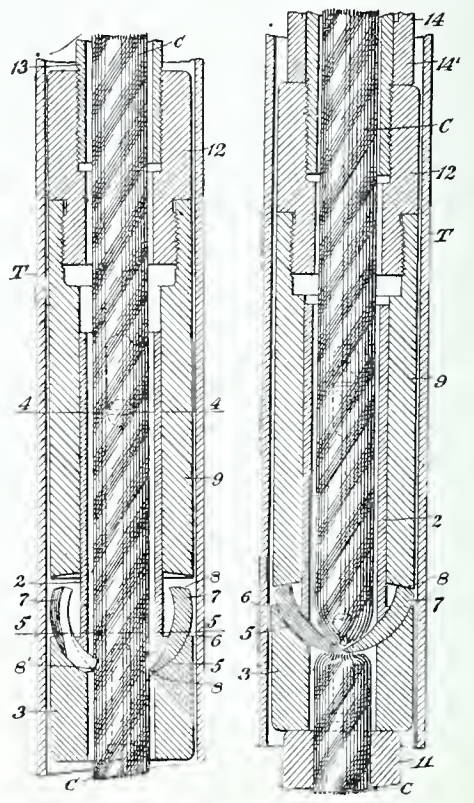
Concrete is recognized as the structural material of the future, and a mold just patented by William T. Harris, Sr., Harrodsburg, Ky., is of timely interest. Any concrete article, from a small brick to a large tile, may be made in a mold constructed in this manner, which is illustrated in the drawings, one of which shows a vertical longitudinal section of the mold, and the other a horizontal section, with the sides swung outward to permit the removal of the block. The core is fastened upon the pallet by means of the slot 2, the sides of the mold being of wood and of the size and proportions desired. Angle irons 4 overlap the corners, and bolts 5 hinge the sides together. The angle iron of one wall has notches which en-



gage with levers, so as to interlock and hold the sides in position. In order to aid in this, and also to prevent loss of material, a hopper 9 is employed, which fits snugly against the outer faces of the mold, and rests on the upper angle iron 4. By pouring the plastic material into the mold and tamping the same, a solid block may be formed. After tamping, the mold is removed and the block left to dry. To form a hollow block, a core 12 is employed, of any desired material and form, and having a locking pin 13, extending down through the same and projecting out of the slot 2. The head 14 on the lower end of this pin is of such shape that it will pass through the slot when desired, but when turned as shown in dotted lines in the lower figure, will project across the slot and hold the core firmly in position in the mold. This pin has lateral arms 15, the upper ones of which bear on the top of the core and hold it firm when the pin is locked in engagement with the pallet, while the lower ones are brought against the top of the core so as to lift it from position within the mold, when the pin is turned so as to release the head 14. In order to remove the core from a molded block without breaking the latter, a screw 16 is mounted in the top of the core and adapted to bear against the upper side of the pallet. Rotation of the screw causes the core to move upward, so that it will not be necessary to knock it to release it from the concrete, and cracking of the block is thus avoided. The cover 17 rests on the block around the core and gives it a smooth surface, and a slight pressure on the cover aids in maintaining the set of the concrete when the core is moved. After the core is loosened from the block by the action of the screw, the locking pin can be raised so as to quickly lift the core from its working position.

Cutter for Well Pump Cables.

When a pump becomes inoperative because the working valves are stuck in the barrel, it is necessary to pull the tubing, which is a slow and troublesome operation, as it involves withdrawing the cable at the same time. As the tubing is withdrawn the sections are easily disconnected, but great difficulty is found in removing these sections from the long cable without cutting the same. This trouble is peculiar to the use of a cable for pumping, and a recent patent by George A. Spang, Butler, Pa, is designed to correct it. It covers a tool that may be lowered into the tubing to cut the cable at the socket connecting with the valves, so that the entire length of cable, together with the tool, are withdrawn before the tube raising operation proceeds. The tool consists of tubular upper and lower members, their meeting ends recessed to form a semicircular cutter passage 5, in which operate the curved cutters 7, with blunt upper and sharp lower edges. The upper parts of these cutters project above the shoulder when they are held in outward position by the cable while being lowered into a well, as shown in the figure to the left, which is a vertical longitudinal section of the device. When forced inward to the cutting position, as shown in the other figure, they are deep in the cutter passage. The tubular hammer 9 moves vertically on the body member, and has slots into which project pins to limit the stroke. When being lowered, the hammer is raised to afford room for the cutters 7 to push out. When the tool is in position, the blows from the hammer on the cutters force them to



meet through the cable. Means to actuate the hammer must be provided, and this must operate in the relatively small tubing. The inventor has devised a form of jars that will embrace the pumping cable. A tubular head 12 of the same diameter as the hammer is coupled to the latter, and connecting with this head is the lower inner tubular member 13 of the jars. On the down stroke of the jars the lower end of the outer member 14 imparts a downward blow to the head 12, and on the up stroke the engagement of the internal shoulder of one jar and the external shoulder of the other, lifts the jars and the hammer for the next blow. A tubular rope socket is provided for the jars.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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HUSSONG DYEING MACH. CO. v. PHILADELPHIA DRYING MACHINERY CO. et al.

(Circuit Court, E. D. Pennsylvania. Sep. 30, 1909. 173 F. R. p. 236.)

EVIDENCE — CROSS-EXAMINATION OF EXPERT IN PATENT SUIT.

Where the direct testimony of an expert, testifying for complainant in a patent case, was confined to the making of a prima facie case by describing the invention in suit, and the alleged infringing device, and the expression of an opinion as to infringement, defendant cannot, on cross-examination, require him to compare the patent in suit with one in the prior art, which is a matter of defense.

LOS ALAMITOS SUGAR CO. et al. v. CARROLL.

(Circuit Court of Appeals, Ninth Circuit, Oct. 4, 1909. 173 F. R. p. 280.)

1. PATENTS — ANTICIPATION — PRIOR DEVICES.

A device which does not operate on the same principle as that of a patent cannot be an anticipation.

2. PATENTS — "ANTICIPATION"—PRIOR DEVICES.

It is not sufficient to constitute anticipation that the devices relied upon might, by a process of modification, reorganization, or combination, be made to accomplish the function performed by the device of the patent.

3. PATENTS—IMPROVEMENT PATENTS-OPERATIONS OF DEVICE.

A patent expressly for an improvement on the device of a prior patent to the same inventor should be read in connection with the first, and will not be declared void because, standing alone, it does not decribe an operative apparatus.

4. PATENTS—VALIDITY AND INFRINGEMENT-LOAD-DUMPING APPARATUS.

The Carroll patent No. 561,485, for a load-dumping apparatus, claims 1 and 2, which cover a combination of elements in an apparatus especially designed to dump wagon loads of beets, and which is highly successful accomplishing such purpose in much less time than required by any previously known means, were not anticipated, although the elements of the combination were separately old, and disclose invention. Patent No. 595,236 to the same inventor for an improvement on the apparatus of the prior patent also held valid, and both held infringed.

5. PATENTS — SUIT FOR INFRINGEMENT—LACHES.

The defense of laches to a suit for infringement of patents held not sustained by the evidence.

CONROY v. PENN ELECTRICAL & MFG. CO.

(Circuit Court, W. D. Pennsylvania. Sep. 30, 1909. 173 F. R. p. 299.)

1. PATENTS — REISSUE — TIME OF MAKING APPLICATION.

Where a suit on a patent was commenced within 15 months after its issue, and within 10 days after it was adjudged invalid by the Circuit Court of Appeals a reissue was applied for which narrowed the scope of the original patent, and it appeared that a decision as to the validity of the original patent was reasonably necessary to establish the necessity for a reissue, the application therefor was made within a reasonable time.

2. PATENTS—REISSUE—IDENTITY OF INVENTION.

Where an original patent was for a method and held invalid because broader than the invention, a reissue covering a machine by which such method, and only that, can be practiced, is not invalid as not for the same invention.

3. PATENTS—REISSUE—VALIDITY-MACHINE FOR CLIPPING GLASS.

The Conroy reissue patent No. 12,789 (original No. 723,139) for a machine for clipping the edge of glass articles is valid.

GAINES et al. v. ALABAMA CONSOL. COAL & IRON CO. et al.

(District Court, N. D. Alabama, S. D. Oct. 6, 1909. 173 F. R. p. 303.)

1. PATENTS—VALIDITY—DETERMINATION ON DEMURRER.

To authorize a court to declare a patent void on demurrer, it must appear from its face and from common and general knowledge of the prior art that the want of novelty and invention is so palpable that it is impossible that evidence of any kind could show the fact to be otherwise.

2. PATENTS—INVENTION — COMBINATION OF OLD ELEMENTS.

To constitue a patentable combination of old elements, they must by their joint action produce a new and useful result, or an old result in a cheaper or otherwise more advantageous way.

3. PATENTS—VALIDITY.

The Gaines and Cox patent No. 760,189, for plant for feeding metallurgical furnaces, held not void on its face.

WILSON TROLLEY CATCHER CO. v. FRANK RIDLON CO. et al.

(Circuit Court, D. Massachusetts. Oct. 14, 1909. 173 F. R. p. 308.)

PATENTS — INFRINGEMENT — TROLLEY CONTROLLER.

The Lord patent, No. 548,074, for a trolley pole and rope controller, claim 4, which claims broadly a tension device for the rope and an automatic lock for locking the tension device when the trolley leaves the conductor, to save it from invalidity by reason of its broad terms, must be limited to substantially the arrangement of parts and the locking mechanism described in the patent. As so construed, held not infringed.

EXCELSIOR DRUM WORKS v. SHEIP & VANDEGRIFT, Inc.

(Circuit Court, E. D. Pennsylvania. Oct. 20, 1909. 173 F. R. p. 312.)

1. PATENTS—CONSTRUCTION—LIMITATION OF CLAIMS BY SPECIFICATION.

A broad claim in a patent cannot be based on a description in a specification that is specifically limited to a single device and does not present it as an example or a preferred structure.

2. PATENTS — SPECIFICATIONS — HORN FOR TALKING MACHINE.

The Soistmann patent No. 873,908, for a horn for talking machines, claim 3, which claims as one element "a reinforcing band surrounding the body of the horn intermediate its two ends," must be limited as to such band to a thin and narrow strip of wood or other suitable material wound spirally from one end of the horn to the other, which is the only band described or shown by the specification or drawings. As so limited, held not infringed.

YOUNGSTOWN CAR MFG. CO. v. B. K. ELLIOTT CO. et al.

(Circuit Court, W. D. Pennsylvania. Oct. 13, 1909. 173 F. R. p. 315.)

1. PATENTS — SUIT FOR INFRINGEMENT — TITLE OF COMPLAINT.

Evidence held sufficient to establish complainant's title by assignment to the patent in suit.

2. PATENTS — VALIDITY AND INFRINGEMENT — BLUE-PRINT MACHINE.

The Fullman patent, No. 771,774, for an apparatus for copying drawings, was not anticipated and discloses invention; also held infringed.

WESTINGHOUSE ELECTRIC & MFG. CO. v. WAGNER ELECTRIC & MFG. CO.

(Circuit Court of Appeals, Eighth Circuit. August 16, 1909. Rehearing Denied Oct. 18, 1909. 173 F. R. p. 361.)

1. PATENTS — INFRINGEMENT—ELECTRICAL CONVERTER.

The Westinghouse patent, No. 366,362, claim 4, for the combination, substantially as described, of an electric converter constructed with open spaces in its core, an inclosing case, and a nonconducting fluid or gas in said case, adapted to circulate through said spaces and about the converter for the purpose of cooling the same, construed, and held not infringed by a converter in which spaces were left between the coils, and between them and the inclosing case, for containing a cooling liquid, but which had no open spaces in its core; that being an essential element of the patented combination.

2. PATENTS — INFRINGEMENT—PROFITS RECOVERABLE—BURDEN OF PROOF.

Where an infringing article contains a material and substantial improvement over that of the patent, the patentee is not entitled to recover all of the profits made by the infringer, but only such as resulted from the infringing parts, and the burden rests upon him to separate the profits arising therefrom by reliable and tangible evidence; nor does the fact that the infringer kept no separate account of such profits relieve him of such burden, where the books were so kept before they had any knowledge or belief of infringement, and without reference thereto.

SIROCCO ENGINEERING CO. v. B. F. STURTEVANT CO.

(Circuit Court, S. D. New York. Oct. 21, 1909. 173 F. R. p. 378.)

1. PATENTS—REISSUE — EFFECT OF DELAY IN MAKING APPLICATION.

Where a patentee, on obtaining information of prior foreign patents and becoming convinced that some claims of his patent had inadvertently been made too broad, promptly applied for a reissue which did not broaden the invention claimed, and no rights are shown to have intervened, the fact alone that the application was not made for seven years after the granting of the original does not render the reissue invalid

2. PATENTS—REISSUE—VALIDITY.

The Davidson reissue patents Nos. 12,796 and 12,797 (original No. 662,395), for a centrifugal fan or pump, are not so clearly void as to justify their being so held on demurrer.

FREEMAN v. THE TRADE REGISTER Inc.

(Circuit Court, W. D. Washington, N. D. Oct. 18, 1909. 173 F. R. p. 419.)

1. COPYRIGHTS—PROCEEDINGS TO OBTAIN—REQUISITES TO VALIDITY.

The law of copyright in the United States is entirely statutory, and all the conditions prescribed are essential and must be observed to give a valid copyright.

2. COPYRIGHTS—PROCEEDINGS TO OBTAIN—TITLE OF WORK.

The fact that the January number of a monthly periodical called the "Pacific Fisherman," which contained a review of the fishing industry for the preceding year, bore on the cover the words "Pacific Fisherman Annual," did not necessarily make such words the title of the publication within the meaning of the copyright law, and the depositing instead of the regular title of "Pacific Fisherman," cut from an inner page of the number, was a compliance with Rev. St. § 4956, amended by Act March 3, 1891, c. 565, § 3, 26 Stat. 1107 (U. S. Comp. St. 1901, p. 3407.)

3. COPYRIGHTS—PROCEEDINGS TO OBTAIN—"TITLE PAGE."

A preliminary page in a periodical which followed advertisements and preceded general reading matter, containing in display type the name of the publication and also the volume, number, and date of the issue, and a copy of which was deposited as the title to obtain copyright protection, must be considered the "title page" within the meaning of Act June 18, 1874, c. 301, 18 Stat. 78 (U. S. Comp. St. 1901, p. 3411), upon which or the page following the copyright notice is required to be printed, rather than a subsequent page containing the title in smaller type but without volume, number, or date, and the printing of such notice on the latter page only was not such a compliance with the express requirement of the statute as will sustain an action for infringement.

WILSON v. FRANK RIDLON CO. et al.

(Circuit Court D. Massachusetts. Oct. 25, 1909. 173 F. R. p. 619.)

PATENTS — INVENTION — TENDER FOR TROLLEY ROPES.

The Wilson patent, No. 597,159, for an automatic tender for trolley operating ropes, makes but a single change in the device of patent No. 563,531 to the same patentee, which consists in making a stop spring connection between the end of the coil spring which actuates the rope reel and the axle, instead of a permanent connection, which mode of connection was old for analogous purposes, and the patent is void for lack of invention.

CURTAIN SUPPLY CO. v. NATIONAL LOCK WASHER CO.

(Circuit Court, N. D. Illinois, E. D. April 5, 1909. 174 F. R. p. 45.)

1. PATENTS — PRIORITY AS BETWEEN INVENTORS — LACHES IN APPLYING FOR PATENT.

An inventor, who, after perfecting his invention and reducing it to practice, without adequate excuse delays applying for a patent for five or six years, and until another has invented and patented the same device, and then applies for and obtains a patent, is estopped by his laches from asserting such patent as against the second inventor.

2. PATENTS — PRIORITY AS BETWEEN INVENTORS—WINDOW SHADE HOLDER.

The Paterson patent, No. 754,404, for a window shade holder, claimed to have been invented by the patentee 5 years and 8 months before he filed his application, is invalid as against the Hoyt patent, covering substantially the same device, which was invented and patented in the meantime.

3. PATENTS — SUITS FOR INFRINGEMENT—DEFENSES PLEADING.

In a suit for infringement of a patent, where defendant manufactures under a patent of prior date, but complainant undertakes to carry the date of his invention back to a still earlier date, although no such issue is tendered by his pleading, defendant may meet such proof, by the defense of laches or abandoument, without pleading the same, since, if pleaded, it would not be responsive to anything in the bill.

MOTION PICTURE PATENTS CO. v. NEW YORK MOTION PICTURE CO.

(Circuit Court, E. D. New York. Nov. 23, 1909. 174 F. R. p. 51.)

PATENTS — SUIT FOR INFRINGEMENT — PRELIMINARY INJUNCTION.

A preliminary injunction against infringement of a patent will not be granted, where it involves the determination by the court on affidavits of the very issue in the case; nor will it be granted in a doubtful case on the theory that defendant, if not an infringer, will not be injured thereby.

SAAKE v. LEDERER.

(Circuit Court of Appeals, Third Circuit, Nov. 20, 1909. 174 F. R. p. 135.)

1. COPYRIGHTS—ACTION FOR INFRINGEMENT—STATUTORY REQUIREMENTS.

Both the right of action for infringement of a copyright, and the copyright itself, are in this case statutory, and a compliance with such statutes is essential to the right of action.

2. COPYRIGHTS—ACTION FOR INFRINGEMENT BURDEN OF PROOF.

In a suit for infringement of a copyright, the librarian's certificate does not per se establish the copyright; but the burden rests on the plaintiff to show compliance with the statutory requirements as conditions precedent.

3. COPYRIGHTS-WHO MAY OBTAIN-ASSIGNMENT OF RIGHT.

A contract by which a foreign author of a dramatic composition granted the stage rights in the United States to another, and agreed to copyright the play in this country, did not convey the author's right of copyright, and an attempted copyright by the grantee in his own name was invalid, and will not support an action by him for infringement.

WESTRUMITE CO. OF AMERICA v. COMMISSIONERS OF LINCOLN PARK.

(Circuit Court of Appeals, Seventh Circuit. Oct. 5, 1909. Petition for Rehearing Overruled Nov. 20, 1909. 174 F. R. p. 144.)

PATENTS—INVENTION—METHOD OF SPRINKLING STREETS.

The Van Westrum patent, No. 752,487, for a method of sprinkling streets by the use of a mixture or solution of oil and water, is not void on its face because it uses the term "solution" where "emulsion" may be the correct chemical term; but its validity is a question to be determined by proof.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Robert E. Cecil, Sewickley, Pa. Mechanical Toy.—This patent discloses a toy of simple construction in the form of a ball supporting a figure of any well-known type, in which the means of support are not readily apparent, the ball being provided with internal mechanism acting to cause the same to move in either a curved path or to take a sinuous or zigzag path; thus, because of there being no apparent mechanism to this end, causing much amusement to the observer.

Robert E. Cecil and Clifford R. Wassell, of Sewickley, Pa. Two patents. Steam and Vacuum Pumps.—The object of this first patent is to provide means for elevating water or other liquids, and particularly to that class of pumps used for this purpose, in which a vacuum is caused within a chamber by the condensation of steam, the atmospheric pressure forcing water into this exhausted chamber, steam then being re-admitted to the chamber to force the water therein up to a higher level through a discharge pipe. The primary object of the invention is to provide a novel, simple and effective structure of this character, adapted for domestic purposes, as for instance, country or suburban places where local water systems are not found, which will be automatic, which will require practically no attention, and in which a maximum of water shall be pumped with a minimum of heat units applied to the steam generator.

The aim of the second patent is to provide for insulating the pipe connecting the steam generator with the pump chamber so that the steam may be properly conserved, to provide means for condensing the steam, and particulary to provide an apparatus wherein the supply of water to the generator shall be intermittently opened and closed before the water has risen to the full height of the generator, thus accelerating the operation of the pump.

Arthur N. Doud, Cleveland, Ohio. Three patents. — The object of the first patent is to provide a hoisting bucket, adapted for use in the construction of concrete buildings, with a suitable base or legs on which the same may rest, said bucket having an opening in the bottom and a swinging closure for said opening, with a chute pivotally mounted on the tie rod which also forms the pivot for the closure, said chute permitting the contents of said bucket to be distributed in any desired direction.

In the second patent, the invention resides in a hoisting bucket provided with an opening in its bottom, a swinging closure comprising a curved plate movable across said opening, and a V-shaped spreader located beneath the closure and mounted on the pivot of the latter, said spreader having a holding bar for maintaining the spreader against movement, whereby the material in the bucket may be directed in any desired direction when the closure is opened.

The third patent relates to improvements in double-door bottom dumping buckets, and provides a door-operating mechanism in which the opening and closing of the doors is effected through the medium of a novel arrangement of levers and links, whereby slidably connected parts are eliminated, such parts being objectionable when the bucket is used for concrete, mortar and the like, since the lodging of such materinl on the sliding parts and hardening thereon prevents efficient operation.

Wallace L. Selleck, Platteville, Wisconsin. Pencil.—The main object of this invention is to provide an attachment for a pencil, combining a pencil sharpener, twine cutter and eraser, which will be especially useful to store clerks, bundle wrappers and the like, where ready means for sharpening the pencil and cutting twine is highly desirable. The device also serves as a point protector when so desired.

William H. Dupre, Vicksburg, Miss. Lubricating Means. — Ordinarily, it has been the practice in lubricating the bearing on locomotive rods and the like to employ a compression grease cup at each bearing. The main object of this invention is to dispense with this method and provide a compression cup which can be easily and quickly attached to a holder, located on the bearing, where the lubricant is desired, and thus provide a cup which can be used in connection with a number of holders.

Joseph B. Green, Wallace, Idaho. Pulp Feeder. Assignor of one-fourth to Harvey A. Houston, and one-fourth to Henry Lieb, both of Wallace, Idaho. — This device is especially designed to overcome the objections to the old gooseneck and plug methods of drawing off the slime from the well-known types of concentrators. The improved method is accomplished by the employment of a siphon which has an inverted inlet end disposed in the bottom of the pulp-thickening settler where the settlings concentrate; and an outlet end disposed at a point slightly below the level of the water in the tank so as to create sufficient head to draw off the sediment. and in such a manner that a comparatively quiescent state of the settlings will be maintained at the bottom of the tank, and yet remove the settlings where they are most dense.

Joseph B. Green, Wallace, Idaho. Slime Feeding Device for Concentrators. Assignor of one-fourth to Harvey A. Houston, and one-fourth to Henry Lieb, both of Wallace, Idaho.—The novelty of this invention relates to a siphon means for removing the settlings from tanks in which the percentage of slime in the tanks is comparatively small. One object of the invention is the arrangement of a water supplying device for operating as a siphon starter, or means for preventing clogging of the siphon, or an agitator in the bottom of the settling tank, when, for any reason, it is necessary to stop the feed to a concentrator, the advantage being to prevent settling of the slime over the inlet portion of the siphon. Another object is the employment of a signal device whereby the attendant is warned when the siphon becomes clogged or otherwise inoperative.

Duncan A. Maccuaig, Nebraska City, Nebraska. Five patents. — The inventor's aim in the first patent is to provide a caster retaining device, made of a single piece of wire, which can be employed in connection with an ordinary caster pintle; is provided with a plurality of bearing elements, and is sufficiently yieldable to enter a socket and pass any obstructions or roughness due to irregularities in the walls of the socket.

The second invention also provides a retaining device constructed of one piece of wire, the patent being subordinate to the preceding one.

The third device is particularly adapted for use with casters provided with enlarged pintle heads, and the improvement resides in the construction of the socket member with springs cut from the walls thereof for holding the pintle in place and permitting its free rotation.

The object of the fourth invention is to construct a retainer of sheet metal, so that it may successfully withstand all sidewise and torsional stress, to which it is subjected, to increase the expansive force of the retainer by providing double spring elements for expanding the retainer, and to protect these spring elements by arranging them within the body of the retainer, the latter being composed of two members which may be forced equally at top and bottom against the socket, in which the retainer is received.

The object of the fifth invention is to provide a caster retainer socket made of a single piece of sheet steel, bent up to form the sides of the socket, these sides being so constructed as to provide tongues adapted to engage respectively with the head of the usual caster pintle and with the interior bore of a furniture leg.

Thomas M. Mills, San Antonio, Texas. Nut Lock.—The object of the present invention is to provide a nut lock, adapted particularly for use on rail joints and one which will prevent the nuts of the bolts from accidentally unscrewing, but will permit the said nuts to be readily removed and replaced. The invention comprises a split washer provided with integral lugs extending from opposite faces thereof, one lug being adapted to engage an aperture in the fish plate and the other adapted to engage serrations on the underside of the nut when the parts are in position.

Amos G. Cox, Winterville, N. C. Combined School Desk and Seat. A. G. Cox Mfg. Co., assignee, same place.—The inventor's aim is to provide a combined school desk and seat, adapted to accommodate two or three pupils, and capable of adjustment to secure the proper tilt to the top of the desk so as to render the same comfortable to the pupils. One of the objects of the invention is to provide for school desks having slotted seats and backs, a guard adapted to shield from view the knees and upper portions of the limbs of the pupils occupying such desks, so as to prevent the disarrangement of dress of such pupils from attracting the attention of the pupils sitting in front of the desk.

William S. Butler, Boothwyn, Pa. Foldable Vehicle Top.—One of the objects of this invention is to provide a foldable top, adapted particularly for use on runabouts or other vehicles that are not provided with, or are not constructed to carry, tops, said top being adapted to be adjusted to different heights, a cover being employed which is readily detached from the front bow when it is desired to have the top down, thus permitting the bows to be snugly folded around the seat when not in use.

Ida M. McPherson, Yatesboro, Pa. Miner's Cap.—This invention has for its object to provide a miner's cap which will not be liable to take fire from the lamp carried thereby, and one provided with means in the form of a shield for protecting the back of the neck and ears of the wearer to prevent the same from accidentally contacting with electric line wires, now largely employed in mines for actuating the cars for removing the material.

James O. Kellum, Bingham Lake, Minn. Street Car Fender.—The invention covered by this patent is designed to improve the construction of street car fenders, and has for its principal object to provide a fender, adapted to be used on the roughest of roads, capable of being automatically thrown upward when it strikes the road surface, and of being positively depressed on the rails when it contacts with a person or object. The fender is capable of ready adjustment to arrange its front end the desired distance above the rails, and is equipped with yieldable means for normally maintaining the fender in such position.

Otto G. Klein, Peoria, Ill. Churn.—The object of this invention is to provide a churn with a plurality of oppositely rotating dashers, adapted also for independent use to arrange the churn to suit different conditions, and also to provide a novel gearing for rotating the dashers, whereby they may be worked simultaneously or independently of each other and by the same mechanism.

James Z. Benedict, Monticello, Iowa. Push Cart.—The main object of the invention is to provide a push cart with an end gate so pivoted to the sides of said cart that it may be readily used at either end thereof, and will be retained firmly in position on the body when said end gate is closed. The cart is equipped with an adjustable axle adapted to be moved backwardly or forwardly to arrange it to suit the character of the load.

James C. O'Donal, Dexter, Mo. Broom Attachment.—This invention has for its object to provide an improved moistener, adapted to be applied to a broom, and capable of delivering water, oil, disinfectant or any other liquid to the straw of the broom in any desired quantities. It comprises a receptacle provided with openings near its base, and divided into an upper storage compartment and a lower distributing compartment, the whole being readily attached to or removed from a broom.

Walter R. Thatcher, Oskaloosa, Iowa. Two patents.—The novelty of the first invention consists in constructing a separator and pasteurizer of two receptacles, one within the other, the inner one being adapted to contain the milk, and the outer one adapted to receive the water of different temperatures and direct the same against the base of the milk receptacle, thus sterilizing the milk, and as the process advances finally separating the milk and cream. The milk receptacle is also provided with a thermometer to ascertain when the proper degree of heat or cold has been reached.

The second patent relates to a milk cooler and pasteurizer wherein the milk is circulated by gravity through a series of pipes which extend first through a tank, in which the water is heated to a high degree of temperature, and thence through a cooling tank. The ends of the pipes are provided with screw caps which may be removed when scalding of the interior of the pipes becomes necessary. The water in the first-mentioned tank is heated by a series of liquid or gaseous fuel burners placed directly thereunder.

Oen Medaris, Butte City, Mont. Amalgamator and Ore Concentrator.—This invention relates more particularly to means for separating gold from the soil in which it is located, and the principal object is to provide a simple structure that will effectively separate and conserve the gold, and one which will operate with a very small quantity of water. A further object is to provide a structure which is comparatively simple, entirely effective in operation, yet readily adjustable to suit the different characters of material to be operated upon, and one which may be easily set up and the parts properly adjusted to effectively perform their work.

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Cost of Patent Suits.

The serious and unnecessary expense of patent litigation has already been commented upon more than once in these columns, but until the required reforms are enacted, the question remains a burning one. It is a relatively easy and inexpensive matter to obtain a patent on a novel device, but when it comes to defending the patent—in other words to establishing its validity—the costs become prohibitive except to those with ample means. The courts have time and again commented upon the extreme outlay involved in patent suits, but nothing in the way of reform has resulted. It is a well known fact that an ordinary patent case cannot so much as get a first hearing in the courts for less than two or three thousand dollars, and frequently the costs mount up to ten thousand or more. Evidently, no man who has not plenty of money at his command can afford to enter upon such a suit. The poor inventor, however worthy his case, must abandon his rights for lack of the funds to enforce them. The mere suggestion of patent litigation is enough to alarm him. "I would sooner assign all my property," declared an inventor, "than undertake such a suit, for there is no telling how I would come out of it." The cost of printing, alone, is enormous. In one celebrated case, the records and court proceedings made up thirty-six large octavo volumes. Judge Hough, of the Circuit Court of New York, took occasion to comment on this matter, and his remarks are so timely and true that we quote them below. He said:

> "It is a duty not to let pass this opportunity of protesting against the methods of taking and printing testimony in equity, current in this circuit (and probably others,) excused, if not justified, by the rules of the Supreme Court, especially to be found in patent causes, and flagrantly exemplified in this litigation. As long as the bar prefers to adduce evidence by written deposition, rather than viva voce before an authorative judicial officer, I fear that the antiquated rules will remain unchanged, and expensive prolixity remain the best-known characteristic of equity. But reforms some times begin with the contemplation of horrible examples, and it is therefore noted that the records in these cases, as printed, bound, and submitted, comprise 36 large octavo volumes, of which more than one-half contain only repeated matter; i. e., identical depositions, with changed captions, and exhibits offered in more than one case. In reading the testimony of one side in one set of cases, there were counted over 100 printed pages recording squabbles (not unaccompanied with apparent personal rancor) concerning adjournments, and after arriving at this number it seemed unnecessary to count further. In many parts of the record, there are not 5 consecutive pages of testimony to be found without encountering objections stated at outrageous length, which may serve to annoy and disconcert the witness, but are not of enough vitality to merit discussion in 2,000 pages of briefs. Naturally tempers give away under such ill-arranged procedure, and this record contains language, uncalled for and unjustifiable, from the retort discourteous to the lie direct. And all this lumbers up the court record room, while clients pay for it! Even when evidence in equity was taken by written answers to carefully drawn interrogatories, the practice was not marked by economy or celerity; but stenography and typewriting, the phonograph and linotype, have become common since our rules were framed, have made compression and brevity old-fashioned, increased expense, and often swamped bench and bar alike by the quantity, rather than the quality, of the material offered for consideration. Motions to expunge and limit cross-examination should have been made in these cases, though they are feeble remedies, exposing counsel to personal reproach, and rendering judges afraid of keeping out of evidence what they cannot (on motion, at all events) understand. But the radical difficulty, of which this case is a striking (though not singular) example, will remain as long as testimony is taken without any authorative judicial officer present, and responsible for the maintenance of discipline, and the reception or exclusion of testimony."

There is crying need of reform in this method of procedure. We presume that statutory provision will be necessary to remedy it, for attorneys will not reach any agreement by common consent. The matter is getting worse instead of better. The case above cited is probably an extreme one, but it shows what is possible in such instances. Important facts, also, are at times buried in the mass of testimony. Attorneys have been known to deliberately try to confuse the records, in the hope that the case may not be decided on its merits, but that the real issue may be lost sight of in overwhelming details, or through appeal to some predilection of the court. Entirely apart from such practices, however, the situation is one that calls for prompt Federal action.

Patent Soliciting Evils.

There is urgent need for the establishment of a higher standard in patent practice. The present condition of the profession is nothing less than deplorable. It is an unfortunate fact that there is too little respect for law, in general, in this land of the free. Americans are proverbially lacking in reverence; but although there are advantages in this enfranchisement of thought from the shackles of tradition and superstition, economists are beginning to wonder if our liberties have not been carried to the point of abuse. Disrespect for law leads to evasion and contravention of its provisions, and to scorn of the profession. This is especially marked with regard to those who practice patent law, and we regret to say, it is in many cases deserved. There is a common opinion that to be a patent lawyer requires no more technical knowledge than to be a pension attorney or a claim agent. Draftsmen, real estate dealers, shop keepers—anyone who does not make a success at his business—feels that he is equipped to practice patent law, and many of them do enter the profession. As a matter of fact, a patent attorney should not only have mechanical skill, acquaintance with a wide range and variety of machinery, but he should have a profound knowledge of patent law, in many respects complex and abstruse. He should know court decisions, have at his fingers' ends hundreds of rulings and be able to apply them for the benefit of his client. When it is remembered that the Supreme Court has declared that patent law is the metaphysics of law in general, the importance and character of the subject may be appreciated. Fortunately for the inventors of the country, there are many patent lawyers who are trained as described; but there are too many others who have no conception of the duty of an attorney, and who enter the profession only to see how much money they can make out of it. They have no ideals, no respect for their calling, and feel nothing but indifference for their obligations. It is these men that lower the standard and degrade the entire profession.

In Europe, where respect for the law is taught to children with their alphabet, the entire legal profession stands much higher than it does in America. In Germany, for instance, the law fixes the exact fees which an attorney can claim for all kinds of professional work, and no one is allowed to exceed this maximum. These fees apply to all matters of the civil code and of criminal cases. This may seem a difficult matter to regulate, but they have adopted the sensible plan of making the amount to be paid depend exclusively on the value of the object of contention. A lawyer, in that country, is never allowed to be a business man, as is the case in the United States. The exercise of the law is regarded as more of a public office, and consequently a public trust, than as a profession which a man enters for the mere purpose of making a living out of it. According to the code, a lawyer is charged publicly with certain duties. He is obliged to have his residence in the town or district where he is appointed. He must conduct himself in and out of office in a way befitting his professional and social standing. He is forbidden, for example, to advertise in newspapers, or to canvass, or to buy and take over a practice already made. These things are considered unworthy of the profession. His position in society is between officials and scholars, and through custom and law he is compelled to keep this position to the last degree. This compulsion to keep his rank has given rise to the existence of committees, whose duty it is to keep a strict watch that no lawyer dishonors his calling. These committees have a strict code of punishment, ranging to complete expulsion from office. In this way the lawyers in Germany have an honored position. In fact, there is scarcely a country in which the lawyer enjoys more respect and confidence. There could hardly be a more striking contrast to the above, than the condition which prevails here. It is true that most of us would resent such supervision as that described, but the need of some efforts in this direction is shown by a glance at the advertisements of certain patent attorneys. In big black type they offer prizes for patents, some even amounting to a million dollars. They offer certificates of patentability; they promise to advertise patents taken out through them all over the United States, or to sell them; they declare that fortunes are made in patents, and send list of inventions wanted. The wise and well informed know of course that these advertisements are all a part of the old game of the gold brick; but there are many inventors who are led astray by them, who really believe that their inventions can be sold as soon as patented, and that the attorney will do what he promises. It is for the protection of these unfortunates, as well as for the purging of the profession of such tricksters, that action should be taken by the Patent Office. It has it in its power to regulate the matter. The Office has required attorneys to be registered, and has issued warnings against such

practices as those above described, but it has never taken the drastic action that is necessary. The Rules of Practice were amended some time ago to permit the suspension and exclusion from practice of attorneys following dishonorable methods. The rule now provides:

"The Secretary of the Interior may, after notice and opportunity for hearing, suspend or exclude from further practice before the Patent Office any person, firm, corporation or association shown to be incompetent, disreputable, or who refuses to comply with the rules and regulations thereof, or who shall, with intent to defraud, in any manner deceive, mislead or threaten any claimant or prospective claimant, by word, circular, letter, or by advertisement, or by guaranteeing therein the successful prosecution of any application for patent, or the procurement of any patent, or which word, circular, letter or advertisement shall contain therein any false promise or misleading representation."

In spite of the authority given by this section, which is based on a statute, no action has been taken against any of the guilty persons. They continue to mislead inventors by false advertisements, and their number is increasing. Conditions are as bad, if not worse, than they were before the change in the rules. The situation is strongly to be deprecated, and we hope that the officials will see their way clear to take the necessary steps to restore the profession to its proper position.

Wrapping Oranges by Machinery.

The orange packing plants of the Pacific Coast have long employed sizers, weighers, brushes, nailing machines, etc., all of which work automatically; but until very recently wrapping was done by hand. A machine has now appeared which automatically cuts and prints the wrapping paper and wraps the oranges. Each machine wraps 100 a minute or over a car load in ten hours, without waste of paper or injury to the fruit, and with perfect precision. Mechanical hands pick up the fruit without bruising the skin and place it on conveyer belts with the stems upward, so that in wrapping the stems are protected by the surplus paper, thus obviating the danger of stem puncture. The wrappers, already cut and printed by the machine, are automatically fed onto the belt and receive the fruit from the mechanical hands. Then the machine folds the wrappers around the oranges and crimps them over the stems so tightly that the fruit can be rolled over a rough floor without undoing it.

Natural Dyed Silk.

A plan for inducing silk worms to dye their own silk as they spin it has been recently tried in France, the method adopted consisting simply in feeding the insects with mulberry leaves saturated with aniline dyes of various colors. The worms ate the prepared leaves with reasonable readiness, and oddly enough, their bodies assumed hues corresponding to the dyes furnished. Thus the insects supplied with red leaves became red; those provided with yellow leaves turned yellow, and those fed upon purple leaves acquired a purple tint. More remarkable still, when they built their silken cocoons, the latter were of a very pretty red, or golden yellow, or pale lilac. Unfortunately, however, the worm could not be persuaded to eat leaves dyed with other colors. Blue, violet and green leaves they would not touch, and when restricted to them as a diet, they simply starved to death. This was discouraging, since it set an obvious limitation to the practicability of producing ready colored silk for market—an idea which, if it could be carried out, would save no little expense. An attempt was made to get over the difficulty by feeding the worms with certain mineral pigments, which the insects consumed readily enough when the mulberry leaves were soaked in solutions of them. But they did not change color as in the other case, and the cocoons were of nearly normal hue, being unaffected to any extent by the pigments. So it is not likely, except in the shades mentioned, that the markets of the world will be supplied with natural dyed silk.

Measuring the Heat of the Stars.

Not only the heat of the sun, but that of the remote inhabitants of our solar system, such as stars, and even occasional visitors like comets, can be measured nowadays. In the base of an electric thermometer a clock mechanism slowly turns a cylinder so that it will continually face the sun, when it is desired to measure the heat of that body. The rays enter the hole of the cylinder, and the apparatus within measures the heat by means of electric wires running into its base. The mean distance of the sun from the earth is some 92,500,000 miles, and its rays reach us in a little more than eight minutes. Next to the sun, the nearest star, "Alpha Centauri" is four years of light away, and until recently scientists believed it absolutely impossible to weigh the almost infinitesimal fraction of a degree of temperature radiated to the earth from such a distance. This, however, has now been made possible by delicate mechanism. Through an ingenious arrangement of mirrors, the point of light from a star is concentrated upon a thread of platinum as fine as the web of a spider. Through this thread a current of electricity is kept flowing, and upon the temperature of this thread depends the electrical resistance, which is measured by the most delicate galvanometer in the world. This galvanometer is a miniature concave mirror of the diameter of a pinhead, placed in the middle of a suspended piece of spun glass fastened upon a delicate bit carved from a dragon's wing. It is, in fact, a balance, the whole being suspended from a fibre of spun quartz crystal, two feet in length and one thousand part of an inch in thickness. Upon being struck by a ray of starlight, the temperature of the platinum thread is changed, the resistance to the electricity accordingly changes and the balance moves. Thus is registered on the scale the exact amount of heat that a star radiates to the earth.

Novel Electrical Appliances.

The methods in which electricity can be scientifically applied to the needs of every-day life are constantly growing. Various new uses have from time to time been mentioned in these columns, and a full account was given of the electrical house in France, where everything is operated by this power. This now has its counterpart in this country, and other novel adaptations are daily reported. Few people realize in how many small ways this power is contributing to make life simpler, more comfortable and easier. It seems, indeed, as if the fairy tales were coming true. Electricity appears to be a sort of Aladdin's lamp, and anything we wish to have accomplished can be done by its agency. We simply press a button instead of rubbing it, and the benign genii at once appears.

Incandescent heaters are in use in many modern offices. They look like fluted tin baking pans, with several dull glass tubes, each about a foot high, within. When the current is turned on, a dull yellow glow illuminates the room, and at the same time a great deal of heat is thrown out. This is due to carbon lights of low efficiency, made so as to give out more heat than light. The heater is a very good substitute for the fireplace log. These same offices have automatic door openers. When a visitor knocks, the door swings open in an uncanny fashion, through the medium of an electric latch unfastener. It is a modernization of the old French system of pulling a rope upstairs and opening the heavy front door.

The new lamps have a long, slim bar of light, instead of a coil, which causes the rays to be more evenly distributed over the desk. The light is made on exactly the same principle as the old-style bulb lamp, except that the filament is straight and is in a closed straight tube, instead of being curled up in a bulb. Then there is the electric vibrator, which looks like a gourd shell on a stick. The wire attached to the handle is placed in a socket and the switch turned on, and a small disk on the end of the neck of the apparatus begins to vibrate with such rapidity that it looks as if it were whirring around. Different kinds of vibrators can be put in the machine, as bits are put into an auger, and the device is valuable in massage, starting up a lively circulation in the part of the body to which it is applied. Little electric stoves are common, and will become more so, as the field for this appliance is unlimited. When the baby cries in the night, all one has to do is to reach out of bed, turn on the current; and in a few minutes the food is heated, all without getting up.

There are other ways of heating water, however. Cylindrical coils of tubing cover wires, and the whole is dropped into the tub of water. It is estimated that it takes about a minute per gallon to get the water to the temperature where a bath is a luxury instead of a test of endurance.

One of the most useful things is the electric iron. Nearly everybody knows what the electric iron is, as it has been on the market for years. A new style has lately been patented, however, that is a great improvement on the old one. The ordinary iron is heavy, especially the tailor's goose iron, which weighs from 30 to 40 pounds. In the new invention, the bulk of the iron is dispensed with, and at the same time its pressing force is not decreased. This is accomplished by placing an electro-magnet beneath the ironing board. The iron contains a magnet also, and by sending a current through both magnet and iron you get pressure without weight. A tailor's iron can thus be made weighing only five pounds, that will have a pressure of from 30 to 90 pounds. The advantage is that by decreasing the amount of metal in the iron you decrease the amount of electric current needed to heat it, so that the whole amount of current in the iron and board now is not as great as that which was formerly used in the iron alone.

But electricity can make things cold as well as hot. The electric refrigerator has hollow walls containing compartments filled with brine and ethyl chloride vapor. The vapor is sandwiched between two compartments of brine. The vapor circulates through the refrigerator and is kept in motion by an electric pump situated just outside. The brine absorbs the heat from the chambers in the refrigerator, the ethyl vapor absorbs the heat from the brine, and by this process a very low temperature is maintained.

It is not alone in the household, however, that electricity proves an efficient servant. It has long been fighting for supremacy with compressed air in mining districts. A remarkable illustration of the durability of electric pumps was given in South Africa after the Boer War, when two shafts of a mine were found to be flooded out. The plant and other apparatus had been left just as they were before the war broke out, and the electric pumps and cables had been under water for two and a half years. Notwithstanding, the motors were brought out, dried and set to work again, and were found to perform their old functions satisfactorily.

Fish shoals are now located by means of electricity. A microphone, inclosed in a water-tight case connected with an electric battery and telephone, is lowered into the water. So long as the telephone hangs free no sound is heard; but when it comes into contact with a shoal of fish, the tapping of their bodies against the case produces a series of sounds which at once betrays their presence.

Ionisation is the scientific name for the electrical administering of drugs. A compress of medicine is placed on the body and an electric current passed through. It has been found by experiments that this introduces the drug into the system, and the method can be advantageously used in the treatment of rheumatism, sciatica, locomotor ataxia and paralysis. Electricity can also be used as an anaesthetic, animals having been put to sleep and operated upon without feeling any pain, and with no bad after effects.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy.—Please give correct data in ordering.—Address,

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Brake-shoe, Magnetic.....E. H. Cockshott et al
Brick-macbine.....C. S. Wert
Briqueting-machine.....G. W. Herbein
Brooder.....P. R. Park
Broom-nailing machine.....S. C. Lay
Brush-back.....S. G. Wilson
Brush, Fountain tooth...F. L. MacDonald
Bucket, Dumping.....A. W. French
Bucket-ear.....H. I. Pague
Bucket, Miunow.....C. Sonke
Buekle.....S. Warren
Buckle for use on suspenders.....C. S. Comstock
Buggy-top aud rein and robe holder, Combined.....A. Hitt
Bung-extractor.....J. S. McLeroy
Burner.....D. L. Reese
Button-loop for overalls...A. E. Plowman
Cabinet and paper therefor.....J. Welsh
Cabinet, Kitchen.....J. E. Tate
Cable-button.....J. Penglase
Camera.....E. L. Hall
Camera-shutter aud means for operating the same.....L. C. Knee
Can for maple-syrup and the like.....J. Vincent
Can loek, Milk.....J. Lokody
Can spout attachment.....A. L. Whitney
Can-vent protector.....F. G. Dickerson
Candlestick, Miner's.....D. B. Beaton
Canned goods, Machine for shaking.....F. H. and F. R. Flounders
Car, Convertible freight.....S. C. Lindsay
Car coupling mechanism, Motor..L. Gremi
Car-door.....C. E. Salsbury et al
Car-door opening and closing mechanism..G. W. Voigt
Car, Dumping.....J. L. Baker
Car-fender.....G. Dysinger
Car-fender, Automatic safety....I. Ksiazek
Car, Railway.....C. L. Schwartz
Car safety appliance, Railway.....J. T. Andrew
Car sand-box.....G. H. Monroe
Carbid-feed mechanism.....A. E. Schlieder
Carpet-holder.....H. J. Boyer
Cartridge, Blank.....L. B. Purcell
Cash-register.....F. K. Fassett
Casket, Canopy.....J. Melzer et al
Caskets, Adjustable bottom for burial....T. A. Lynch
Cattle-cbeck.....P. G. Henoen
Cement-brick press.....C. M. Starr
Centrifugal separator.....J. J. Berrigan
Chain-repairing implement.....J. N. Macdonald
Channeling-machiues, Adjustable work support and gage for.....A. H. Prenzel
Cbarging-switch.....W. S. Henry
Check-controlled mechanism.....H. V. Westervelt
Check-controlled apparatus.....M. J. Walther
Check device, Manifold.....F. B. Jordan
Chimney-cover.....D. A. Clayton
Chuck, Lathe.....H. C. Nelsen
Chute.....W. Drever
Cider-mill.....G. L. Putt
Circuit-breaker.....J. Young
Cireuit-controlling apparatus, Time.....A. P. Nelson
Cireuits, Multiple drop-hoist system of....A. M. Coyle
Clutch.....W. W. Prather
Clutch.....H. Tscberning
Clutch, Automatie.....O. C. Talbot
Clutcb, Electrie friction.....L. H. Dyer
Clutch mechanism.....W. C. Zelle
Collapsible table or seat.....M. Smiljanic
Collar-fastener.....C. Tompsett
Collar fastener, Animal.....J. Meyer et al
Collar-stiffener.....N. Simon
Collar stiffener, Garment.....R. Gaspard
Concrete construction.....P. Aylett
Concrete-construction system.....P. Aylett
Concrete reinforeing structure.....E. E. Nickson
Concrete post.....D. Eskew
Conerete roadway, Oil...E. M. Chadbourne
Concrete-wall mold, Ventilated.....H. T. Frost
Cord or other material, Mauufacture or treatment of lengtbs of.....T. Sloper
Cotton-chopper.....J. Descbamp
Cover for flesh-contact implements, Sanitary.....G. H. Coates
Crabs and other crustacea, Apparatus for picking.....C. F. Greiner
Cream eooler and aerator, Pasteurized....E. S. Snively
Cream-ripener.....H. Cbristensen
Cultivator.....F. Divin
Cultivator and furrow-marker, Combination.....S. Scballer.
Cultivator and seeder, Combined...W. Foy
Cultivator attachment.....C. J. Rowlee
Cultivator, Irrigating.....E. F. Douglas
Cultivator replanting attachment.....J. B. Engstrom et al
Cuprammonium solntion, Making..2 pats..H. Bernstein
Curtain-fixture.....H. Reubel
Cutter-bar.....J. H. Poole et al
Damper-regulating apparatus.....J. B. Crandon
Derrieks, Mast-step for.....C. H. Peters
Die-stock..3 pats.....H. W. Oster
Die-stock reamer attachment.....G. Reeb
Display-box.....F. K. Andrews
Display-case.....W. S. Shaffer
Display-cases or similar structures, Joint for.....D. E. Hunter
Display rack, Merchandise..A. T. Edwards
Distillery-slop to dry feed, Reducing.....E. A. Hoffmaun
Door catch, Screen.....J. L. Zesiger
Door-fasteniug spring.....S. P. Stevenson
Door-stop.....G. J. Poeppelmeier
Doors, Paneling.....H. W. Phillips
Draft-equalizer.....H. O. Turner
Draft-rigging.....G. Hargreaves, Jr.
Draft-rigging.....J. M. Dutelle
Drafting instrument.....H. F. Noyes
Drawer for eard-catalogues...R. D. Hayes
Drill-bole-testing apparatus.....M. Garvey
Drill-room floor.....R. R. Bradley
Drying goods.....L. von Susskind
Dumb-bells, Spring-grip attachment for....W. J. Dossetter
Dust-collector, Hand-propelled.....F. C. De Vallant
Dyeing-machine.....W. A. Fowler
Dynamos, Automatic potential-regulator for.....J. J. Mueller, Jr.
Edge-trimmer.....A. J. Johnson
Electric cable.....W. Geipel
Electric cables, Connection and seal for the cnds of.....F. N. Bierce et al
Electric-light fixture.....E. E. Hayward
Electric motor.....F. L. Sessions
Electric pressure-ratio indicator.....A. W. K. Billings
Electric selector aud signaling apparatus..W. W. Alexauder
Electric switch.....W. M. Scott
Electrical connections, Junction-box, receptacle and plug for....W. A. Hopkins
Electrically-heated apparatus...H. B. Gale
Electrically-operated switch..J. A. Lundeen
Electrochemical apparatus and process....E. H. Meyer et al
Elevator-retarding mechanism, Plunger....A. L. Schuller
Elliptic spring.....H. Jeffrey
Engine attachment, Automobile.....O. F. Griffiu
Engine-controlling apparatus, Hoisting....C. R. Welch
Engine sparking plug, Explosive.....C. F. Jones
Engines, Driving mechanism for paper-refining.....S. R. and W. L. Wagg
Engines, Supplying fuel to heat.....G. F. Jaubert
Envelop.....A. Keroff
Envelop.....J. J. Zasmeta
Envelops, Machine for applying metallic fasteners to.....W. E. Swift
Escapement-regulator.....F. Ecaubert
Escapement-regulator, Compensating.....2 pats.....F. Ecaubert
Evaporating or concentrating liquids, Apparatus for.....E. Shaw
Evaporator.....P. Kestner
Evaporator.....A. S. Morris
Expansible roller.....O. Cullman
Explosives, Device for thawing.....G. S. Sneer
Eyeglasses.....J. P. Barlow
Fabric-piling mechanism.....J. A. Butler
Faucet, Water.....E. A. Strong, Sr.
Feed-bag.....J. F. Hammel
Feed-bag.....C. D. De Lap
Feed-bag and support therefor.....J. F. Hammel
Feed-box.....E. P. Endicott
Feeding device, Animal.....R. E. Runner
Fence-post.....J. W. Culp
Fence-weaving machine, Wire.....C. A. Willmartb
File-binder.....J. C. Dawson
File-wrapper.....V. Munger
Filing-case.....C. L. Glafcke
Filter.....J. S. Gladhill et al
Firecrackers, Machiuc for manufacturing..I. M. Bond et al
Fire-extinguisher.....A. F. Spawn
Fire-kindler.....F. Jasmer et al
Firearm.....M. Schrader
Fishing-rod support.....T. M. Lynch
Flat-key loek.....J. Roche
Floor-cleansing apparatus..A. E. Moorhead
Flushing apparatus, Air-seal..H. D. Moise
Flushing apparatus for elosets, &c.....H. D. Moise
Flux for brazing metals.....W. W. McIver
Fly-paper holder.....O. J. Boos
Flying-machine.....F. L. Gould
Flying-machine.....C. B. Cronan
Flying-machine supporting-plane.....J. G. and F. Stites
Folding bracket.....A. D. Hill
Folding table.....K. G. Johanson
Fuel briquet and making same.....M. and G. Salomon
Furnaee draft-regulating device.....W. P. Hall
Game apparatus.....P. Makray
Game apparatus, Base-ball.....J. F. and A. S. Hayes
Garbage-burner and water-beater.....W. G. Ross
Garbage, Reducing.....J. W. Altick et al
Garment.....B. S. Bankart
Garment-hanger.....A. J. Smith
Gas, electrie and combination fixture.....L. W. Anderson
Gas-engine, Revolving.....G. Haniquet
Gas for inflating aerostats, Manufacturing..O. Nauss
Gas-serubber.....A. Steinbart
Gate.....R. E. Trombley
Gate-controlling apparatus.....E. W. Vest
Gearing.....F. A. Ward
Gearing.....W. D. Marks
Gearing, Power-transmission...J. W. Reno
Glass-drawing apparatus.....L. Mambourg et al
Globe or shade holder.....A. Kratzl
Grab hook, Log.....H. Johns
Grader and leveler, Road...J. S. Haynes
Graduated release-brake.....W. V. Turner
Grain-conductor tubes, Device for automatically cutting finished telescopie.....F. C. Wheeler
Grain-drier.....F. A. Wegner
Grain-huller.....A. J. Banmann
Grain-separator.....J. Jacobs
Grate.....F. Hilburger
Grate.....J. Levey
Grinder.....F. A. Ward
Grindiug-machine.....D. E. Plaisted
Grinding rollers, Machine for....G. Weeks
Gun, Machine.....R. Raines
Gun, Parachute.....F. D. Barnes
Gun-sight.....W. L. Hall
Gun-sight.....C. A. Wingren
Hacksaw-frame.....J. Dockerty
Hammer, Farrier's nail-driving.....W. J. Kelly
Hammocks, Spring-support for..2 pats.....A. F. Sanborn et al
Hand-drill.....F. P. Shek
Harrow.....A. C. Lindgren
Harrow.....G. B. Canada
Harrow and digger.....S. Larson
Harrow, Flexible.....J. Brower
Hat and coat hanger, Pocket.....J. A. Benjamin
Hat-rack.....R. Samson
Hay-press.....C. L. Miller et al
Heating plant, Solar.....M. L. Little
Heating system.....R. M. Dixon
Heel, Detachable leatber..M. L. Silverstein
Hinge, Door.....G. H. White
Hinge for molding-flasks.....H. H. Sanner
Hog-scraping machine.....W. Gussenhoven
Hoist, Farm.....C. C. Furnberg
Holder.....V. M. Fuller
Horseshoe.....W. A. Nieman
Hoseshoe, Non-slipping rubber-tread.....T. S. Moffett et al
Horseshoes, Making.....G. Weber
Hoseshoe-overshoe.....J. Stanley
Hose-coupling.....J. W. Ferguson
Hose-rack.....G. Bennett
Hot-water heater.....M. J. Selzer
Hydraulic safety-clamp.....M. Garvey
Ice-making apparatus, Artificial..2 pats...O. H. Jewell
Incubator, Self-regulatiug.....L. C. Reed
Index.....G. Thackrah
Individual table.....M. C. Shannon
Insole coveriug and reinforcing machine..W. C. Stewart
Insulator.....J. F. Malthaner
Ironing-board.....G. Wynder
Ironing-board sleeve-board attachment.....J. E. Kalgren
Journal-box.....J. M. McFadden
Keel-block.....P. Keymer
Keyhole-guard.....G. F. C. Muller
Keyless lock.....O. M. Farrand
Keyless lock.....D. B. Kinsey
Knitting machines, Duplex striping mechanism for circular.....W. P. Young
Knitting machines, Yarn-changer for circular.....H. H. West
Knob-lock..2 pats.....W. A. Hill
Knuckle, Emergency.....J. G. McPherson
Ladder and scaffold, Combined.....R. A. Holdridge
Lamp..2 pats.....W. C. Colemau
Lamp.....E. M. Rosenblutb
Lamp-chimney attaebment...C. D. Huddle
Lamp-cluster.....G. A. Harter
Lamp or lantern burner.....A. F. Prahm
Lamp receptacle, Incandescent-electric....A. Weber, Jr.
Lamp socket, Electric.....E. P. Poole
Lamp socket, Incandescent....N. Marshall
Lamp support, Carriage.....H. L. Cowles
Lamp, Vehicle.....I. H. Atwood
Last, Shoe.....I. A. Cook
Latch, Gate.....C. C. Shoff
Lead refining and desilverizing apparatus..G. P. Hulst
Leather and manufaeturing the same, Reinforced.....E. Weinheim
Leather-board and prepariug the same, Waterproof.....E. S. Buffum et al
Lenses, Instrument for measuring and determining the axes of.....O. Moe
Letter-slot attachment.....J. Popenhagen
Lighter, Pocket.....L. V. Aronson
Level.....J. L. Russell
Light-projectiug apparatus....C. E. Nilsson
Lightning-rod, Electrie-eable...L. L. Mast
Line-holder.....A. Hitt
Linoleum product and making same.....B. S. Summer
Linotype-machine.....T. S. Homans
Liquid-storing device.....J. C. Kellogg, Jr.
Liquids, Concentrating.....P. Kestner
Localizing apparatus.....J. R. Kelley
Lock.....W. C. Burge
Log-turner dog.....W. A. Overcash
Lubricator.....T. E. B. Brown et al
Magneto-geuerator.....L. W. Noyes
Mail-bag catcbing and delivering apparatus.....G. W. Saylor
Mailing paekage and wrapper..H. L. Day
Manhole-cover.....O. T. Dougherty
Manifolding device.....G. H. Robinson
Match-box and supporting-raek, Combination.....L. D. Kelso
Match-box holder.....W. B. Seeley
Matrix-plate.....G. W. Clarke
Mattress.....P. Klimowicz
Measuring and recordiug maehine.....A. B. Booth
Measuring instrument.....T. J. Pitts
Meat roller-press.....C. G. Schmidt et al
Meat-tenderer.....C. S. Miller
Mechanical movement.....K. Hoepfner
Metal-bending machine.....J. E. Eriekson
Metal-eutting tool.....C. K. Lassiter
Metal-transfer apparatus.....S. Dillon
Metal-working machines, Work-holding meehanism for.....F. O. Farwell
Metallic fabric.....F. Momburg
Metallic wheel.....S. Strobl
Micrometer-stop.....F. R. Cunningham
Milk-receptacle.....E. H. Humphrey
Milking-machine.....G. E. Jonsson
Mirror and support, Adjustable.....S. Bacharach
Miter-box.....A. A. Wilson
Mold.....C. S. Wert
Mold-coating apparatus....J. A. Mohr et al
Molding or casting process and apparatus.....G. Atterbury
Mop.....H. B. Wallace et al
Mop head and wringer.....C. H. Lieu
Motor-control system.....E. L. Gale, Sr.
Motor-controller.....H. W. Cheney
Motor-controller.....G. H. Whittingham
Motor controller, Electric.....G. H. Whittingham
Motor-controlling apparatus, Electric.....G. H. Whittingham
Motor-controlliug means, Electric.....G. H. Whittingham
Motor-starter.....G. H. Whittingham
Motor-starter, Automatic.....G. H. Whittingham et al
Motor starter, Electric..W. C. O'Brien et al
Motors, Means for stopping electric.....G. H. Whittiugham
Mouthpiece-cover, Antiseptic.....W. H. Waldron et al
Musical instruments, Automatic drum-beater for mechanically-operated.....W. A. Brauer
Musical instruments, Duplex tracker-board for automatic.....M. Clark
Necktie.....C. W. T. Davies
Needle, Tufting.....C. W. Sellstedt
Nest and feeder, Poultry.....A. J. Leddell
Non-skidding device.....H. P. Brown
Nozzle for fire-fighting apparatus.....M. H. Hart
Nut, Hub.....W. A. Stewart
Nut, Jam.....R. Lewis
Nut-lock.....T. J. Davis
Nut-lock.....T. J. Jones
Oil-burner.....A. H. Light
Oil-burner.....W. E. Weathers
Oil burner, Crude.....O. Kirschen
Oil burner, Crude.....J. A. McCroach
Oil-burning heater.....P. Lisienicki
Oil-can.....L. M. Graves et al
Ore-crusher.....I. L. Mitchell
Ore-treatment vats, Fluid-distrihuting pipe for.....C. E. D. Usher
Ores, Extracting or separating precious valnes from.....J. S. Island
Ores, Jigging-machine for dressing.....H. R. Hancock
Overalls.....T. B. and J. C. Pell
Overhead switch, Portable..J. C. Fitzgerald
Oxygeu, Briquet for making..G. F. Jauber
Oxygen, Making briquets for producing..G. F. Jaubert
Packeting-machine.....C. S. Nyberg
Packing, Metallic.....W. B. Claflin
Packing, Metallic rod....C. L. Trapp et al
Packing, Turbine.....R. A. McKee
Pad-forming machine.....A. L. Dutilleul
Paint, Fireproof and waterproof.....J. J. Barnes
Paper and holder therefor, Toilet-seat.....C. W. Giblyn et al
Paper-feeding machine.....T. C. Dexter
Paper-making machinery....H. L. Orrmau
Paper-treating machines, Automatic disconnecting device for....R. E. Fischer et al
Parer, Fruit.....G. W. Gates
Paving-rammer.....W. H. Nordstrom et al
Pedestal.....J. Lehman
Pencil attachment.....W. L. Selleck
Pencil-sharpener..2 pats.....E. B. Welles
Penholders, Ink-scraper attachment for....J. E. Shouse
Percussive apparatus, Self-feeding.....W. Mauss
Phenols and aldehydes, Hardening condensation products from.....H. Lebach
Pianos, Expression mechanism for self-playiug.....P. Wuest, Jr.
Picture-frame, Knockdown adjustable.....E. J. Dreisbaeh
Picture, Triek.....H. G. Pelstring
Piling, Steel sheet.....C. C. Conkling
Pistol.....G. A. Hansen
Piston and piston-valve.....R. Allen
Plane, Carpenter's.....R. Tilles
Plant-tying device.....G. S. Remsburg
Player, Automatie.....J. A. Weser
Plow, Lister.....C. L. Harbolt
Plug, Attachment.....H. T. Paiste
Pneumatic-despatch-tube systems, Sending-terminal for.....Franklin H. Wolever
Pocket, Pencil-holder.....F. A. Weeks
Portable bath.....A. E. Hoover
Potato-digger.....P. A. Thompson
Powder-box.....W. R. Gillette
Powder-press.....A. G. Cummings
Power-transmitting apparatus...J. Dunlop
Power-transmitting mechauism.....T. F. Weiland
Press.....W. Klocke
Printiug-maehiue inking mechanism.....W. Spalckhaver
Printing mechanism.....E. W. Dean
Projectile.....H. Brust
Projectile, Double-walled exploding.....M. Glass
Propeller.....T. A. Hiekman
Propelling meehanism, Marine.....T. Moriarity
Pull-soeket.....H. T. Paiste
Pulley, Clutch.....H. H. Locke et al
Pump-cylinders, Expansiou-plunger for....W. F. Jacobs
Pump-governor, Compouud steam.....A. England
Pumping machinery, Direet-aeting.....J. Hutchings
Pumping oil and other wells, Method of and apparatus for.....B. F. Gardner
Pumps, Pressure-governor for electrically-operated.....F. L. Clark
Punching-tables, Spacing device for.....F. H. Blanding
Radiator.....D. T. Lyon
Radiator, Heat.....S. M. Redfield
Rail-joint.....N. H. Roe
Rail-joint, Steel.....W. Arndt
Rail-joints, Compound fish-plate for.....J. C. Cramp
Railway-hopper, Duplex..W. E. McPherson

Railway shock-absorber, Street....F. Bex
Railway-switch foot-guard.....T. A. Peterson
Railway tie-plate.....W. L. De Remer
Railway-track.....A. Cottom
Razor-blade holder.....C. M. Craue
Razor-blade holder, Safety.....G. S. Pope
Reamer.....T. E. Stevenson
Recorder.....M. E. Leeds
Recording apparatus.....E. M. Schautz
Reel.....E. G. Thomsen
Refractory composition.....T. McMahon
Refrigerator.....F. Lutz
Refrigerator.....N. Heymann
Refuse-destructors aud other furnaces, Chaging-door for.....H. N. Leask
Retort-door lockiug means...C. F. Pickton
Reversing-switch.....G. H. Whittingham
Rheostat.....H. Hertzberg et al
Roasting-pau.....J. Kautz
Rock-drill.....E. M. Mackie et al
Rope-fastener.....E. E. Colsou
Rotary engine.....R. Lundquist
Route-guide.....O. Cullmau
Rule.....S. A. Gaster
Safe for valnables, Portable.....H. W. Woodruff
Safe lock mechanism.....J. Klosiensky
Sand heater and drier.....C. A. Mullen
Sanitary case for toilet articles and other nses.....S. Woods
Scaffold, Portable..J. Kitsteiner, Jr., et al
Sealing apparatus, Bottle..G. M. C. Nielsen
Sealing bottles.....B. Adriance et al
Sealing composition.....J. C. Taliaferro
Sealing device for newspapers and the like.....F. H. Beals
Seaweeds for food, Preparing.....T. C. Frye et al
Seed grader, cleaner, aud purifier, Combined.....C. B. Benson
Sewer-cleaning apparatus..J. W. Stolkrantz
Sewers, Catch-basin for.....B. F. Nicholas
Sewing-machine attachment, Wax-thread..C. L. Eaton
Sewing-machine belt-gnard.....M. Rosenbloom et al
Shade bracket and hanger, Window.....W. D. Merrell
Shade or globe holder.....A. E. Smithdale
Shades, &c., Casing and guide for window.....M. W. Conway
Shank-pieces, Machine for attaching.....E. F. Mower
Sheet-cutting machine.....F. W. Stevens
Sheet-delivery mechanism....E. W. Dean
Sheet-gathering machine.....A. M. Price
Shelf.....G. R. Earnest
Shell for artillery.....C. W. Gebauer
Shepherd's hook.....H. E. Newman, Jr.
Shingle-band-making machine.....J. E. MacMurray
Shingles and slabs and the like, Machine for pressing.....J. Baade
Shoe-cleaning device.....M. Benn
Shoe-cleaning machine.....G. Geraldson
Shoe-uppers by means of wire, Apparatus employed for fastening.....J. Cavanagh, Jr.
Sifter, Ash.....R. and P. J. Brownson
Sign.....J. C. Smith
Sign.....B. H. Cooley
Signs, Gas-flashing apparatus for.....H. G. Sutton
Signal.....M. F. Welch
Signaling device.....G. Lawrence
Sink-plate.....J. T. Franta
Sink-trap.....W. J. Ray
Sleigh brake and stop.....H. F. Troh
Soil, Device for testing the structural qualities of the.....H. Menzel
Soda-fountain dispensing device.....W. H. Becker et al
Soldering-tool, Self-heating..A. Herrmann
Sole laying and leveling machine.....T. G. Plant
Sonnd-record-duplicatiug apparatus.....S. I. Prescott
Sonnd recording and reproducing machines, Transmitter for.....S. I. Prescott
Sonnd-reproducing machine...S. I. Prescott
Sonnd-reproducing machine....S. M. Wirts
Sound-reproducing machines, Amplifier for.....S. I. Prescott
Sound transmission.....S. I. Prescott
Spark-arrester.....H. Schmidt
Spark-plug.....R. E. Estes et al
Staple-holder.....C. G. Richards
Speed-changing mechanism.....W. H. Holland
Spinning machine, Ring....A. G. Koechlin
Sputum-cup, Pocket.....J. A. Brooke
Square, Universal.....D. C. Meeker
Stacker, Pneumatic.....W. F. MacGregor
Stamp-affixing machine.....R. Abram
Stamps, &c., Means for detaching from the sheet and affixing postage.....F. Meyer
Stencil-inker.....E. N. Winston et al
Stereotype-making apparatus.....J. J. C. Smith
Stereotype-molds, Making...J. J. C. Smith
Stethoscope.....N. Fuehs
Stove, Gas.....J. S. Dearborn
Stove, Gas.....T. J. Hughes
Stove-top.....F. W. Rogers
Straining-cloth holder.....J. D. Tucker
Street-box.....W. McLean
Street-cleaning machine.....R. H. Stephens et al
Street-sweeper.....E. F. Spicer
Stove-oven.....C. V. Blomskog
Suetion cleaning apparatus, Separator for.....D. Hurley
Suit-hanger.....L. Gemmer
Surf-compressor apparatus..J. L. Matthews
Surgical-needle, Quick-threading.....M. J. C. Nyborg
Swinging seat or hammock, Collapsible....J. A. Spence, Jr.
Switch.....C. W. Burke et al
Switch and fuse supporting base.....W. J. Gibbons
Switch appliance, Auxiliary automatic safety.....F. W. Snow et al
Table-base, Folding.....J. Karbinger
Tag-making machine.....C. von Philip
Tank and support.....O. K. Harry
Tank or container.....A. Jndeviue
Tapping apparatus.....G. W. Speucer
Teeth, Compositiou for use iu buruing artificial.....H. Wienand
Telegraph and other pole...J. F. Hickman
Telegraph iustrnment.....F. G. Slemmer
Telegraphy, Submarine-cable..S. G. Brown
Telephone and telautograph exchauge system, Combined.....F. Ritchie
Telephone-exchanges, Automatic peg-counter for.....C. H. North
Telephone service, Apparatus for measuring.....C. W. Greenslitt
Threading-machine.....H. W. Oster
Throttle.....J. Peterson
Tie-plate and anticreeper, Combination.....P. W. Moore
Timepiece balance-wheel.....F. Ecaubert
Timepiece compensating-balance.....F. Ecauhert
Tin from tin-scrap, Apparatus for extracting.....E. C. Higgins
Tire, Antiskid.....H. G. Raflovich
Tire armer, Pneumatic.....A. H. Macbeth
Tire, Elastic.....J. P. Magney
Tire, Emergency.....C. M. Culp
Tire, Pneumatic.....J. Copwin
Tire-protector.....W. T. Dorgan
Tire-protector, Automobile....J. S. Ehrich
Tires and spokes in fellies, Tightening.....A. B. Smith
Toasting and broiling pan..W. P. Scherer
Tobacco-moistening device.....M. Falk
Toggle-bolt.....A. L. Ellis
Tool, Combination.....D. W. Kinsel et al
Tool-driving appliance.....J. M. Palmer
Tool-operating device, Automatic.....J. M. Abrams
Tool with removable handle.....P. O. Peterson
Tooth.....G. E. Stallman
Tooth, Artificial.....F. A. Wienand
Towel-holder.....O. D. Hammond
Toy-bank..2 pats.....C. A. Bailey
Toy briquet-mold.....L. B. McDaniel
Toy top.....J. A. Irving
Transformer.....M. Eastham
Transom-adjuster.....A. G. Brazier et al
Transplanting-box.....A. Rockwood
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Toy.....H. F. Samstag
Toy dump-cart.....H. T. Kingsbury
Toy target.....W. S. Root
Train-order deliverer.....N. Forsythe
Transplanting-machine.....G. E. Autry
Tray, Bottle.....F. Sochurek, Sr.
Trolley.....S. H. Smith
Trolley safety-lock.....J. L. Blair
Trousers-supporter.....F. M. Hilgert
Truck.....V. A. Jenks
Truck-frame bolster-guide..H. T. Anderson
Truck frame, Car.....W. F. Richards
Truck-frames, Bolster-guide for.....H. T. Anderson
Truss.....W. Lange
Tubing.....E. T. Greenfield
Turbine-blade-fastening means.....C. E. Sweet
Turbine, Combined liquid and gas.....C. E. Broekhausen
Turbine, Gas.....L. Samoje
Turbine-rotor.....O. D. H. Bentley
Type for type-writing machines, Manufacturing.....W. R. Fox
Type into classes for distribution, Apparatus for separating.....D. B. Ray
Type-writer baek-spacing device.....C. Mercer
Type-writing machine.....C. E. Smith
Type-writing machine.....M. S. Cumner
Type-writing machine.....H. E. Curtis
Type-writing machine..A. G. F. Kurowski
Urinal.....N. Frost
Valve.....E. J. McCarty
Valve.....S. H. Woodridge
Valve.....J. P. Haige et al
Valve.....R. W. Elder
Valve, Exhaust-muffler cut-out..H. Miller
Valve, Flush.....J. Rothchild
Valve for air-pipes, Butterfly.....A. Faget
Valve for dash-pots, Regulating..C. Dorn
Valve, Inflation.....J. E. Keller, Jr.
Valve mechanism for internal-combustion engines.....H. Steingrassner
Vaporizer, Formalin...J. J. Van Dandaigne
Vehicle running-gear attachment..R. Grube
Vehicle-step.....G. P. H. Nelson
Vehicle-top.....G. F. Brewster
Vending-machine, Coin-controlled stamp.....C. Elliott
Veneer-applying machine.....A. S. Nichols
Ventilator.....L. S. Levi
Voting-machine.....L. R. Winslow
Wagon-dump and grain-elevator, Portable..H. S. Swanson
Wagon-reach.....D. Cosner
Washing-machine.....D. Cameron
Watch winding and setting mechanism.....E. Wolf
Water-closet valve.....B. T. Beardsley
Water-gage attachment.....Z. C. Ferris
Water-gage glass.....N. Zucke
Water-meter..5 pats.....H. I. Dilts
Water-softening apparatus.....K. W. Bartlett
Weeds, Destroying.....W. Hoskins
Weighing-machine, Automatic..A. Sonander
Welding apparatus, Electric.....A. E. Buchenberg
Wheel rim, Vehicle.....J. M. Alderfer
Whip-rack.....E. Dillabaugh
Window.....O. M. Edwards
Window provision-holder.....A. W. Sutherland
Window-screen.....C. J. Wallen
Windows, Antirattler for..E. E. Clark et al
Windows, Antirattling dust and weather guard for.....I. H. Athey
Wire-clamp.....H. R. Ritter
Wire netting, Manufacture of woven.....A. W. Storey
Wire-splicer.....A. V. Anderson
Wire with yarn or its equivalent, Machine for covering or insulating.....D. Noble
Wooden articles and preventing straightening thereof, Forming bent..T. R. Bruffy
Woodworking-machine.....C. W. Borg
Woodworking-machines, Guide and chip-breaker for.....C. W. Borg
Wrap.....N. T. Mercey
Wrench.....W. E. Panlson
Wrench.....W. C. Schneider
Yoke holder, Neck.....H. E. Dey
Zinc oxid from zinc ores and products, Obtaining.....W. Hommel et al

DESIGNS.

Casket-handle.....P. R. Zinser
Glass dish.....S. Herbert
Lamp, Automobile.....B. V. Seevers
Lamp-post.....J. D. Ross
Mirrors, brushes, or similar toilet articles. Back for.....G. H. Berry
Picture-frame.....M. Jankiewitz
Ruler.....J. W. Guillott
Stove.....G. W. Cope et al

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MECHANICAL PATENTS.

Abdominal supporter.....L. N. Saemann
Abdominal supporter.....S. H. Sublett, Sr.
Abrading-roller.....R. and W. Stipe
Abrasive material and mounting.....R. Gardner
Advertising and display apparatus.....A. F. Schmidt et al
Agricultural implement.....A. C. Lindgren
Air-compressor.....G. C. Vollmer
Air-compressor adapted to work as a vacuum-pump.....E. Gaucher
Alarm.....V. Puha
Alarm system.....A. Goldstein
Alarm system, Central-energy.....J. C. Francis
Alarm system, Electrical.....A. Goldstein
Antiseptic body germ protector.....H. Jaffee et al
Apparel apparatus.....E. Kasralowicz
Armor-plate.....W. S. Simpson
Ash-tray for keyed-instruments.....M. C. Herbst
Atomizer-pressures, Device for alternating.....N. McCarty
Auger-bit.....J. T. Pugh
Automobile auxiliary spring..C. L. Thomas
Automobile traction device.....C. F. Zillmer et al
Automobile wind-shield.....F. W. Aurig
Awning.....G. Zeliff
Axle with drive, Automobile front.....A. O., A. R., and C. W. Nordquist
Bag-cleaning machine.....E. L. Buschman
Baling-press.....E. J. Steinberger
Bark-removing process....A. R. Wilkinson
Barrel, Metallic.....H. W. Avery
Barrel-washing machine.....E. H. Wright
Bearing, Ball.....T. Partridge et al
Bearing, Ball.....H. Hess
Bed-frame.....E. J. Playfoot
Bed, Settee.....C. J. Kindel
Bed spring and frame..F. W. H. Weishaupt
Bed, Wall.....L. E. Fry
Bedclothes and the like, Filling for.....L. J. Wolfe
Belt-fastening device, Driving.....F. Mitchell et al
Belt-lacing machine.....E. Toole
Belt or truss, Supporting.....H. L. Benner
Bench-key, Multiple....F. R. Cunningham
Bending-machine.....F. J. Fisher
Berth and chair, Sleeping-car..F. J. Leigh
Bill-filing cabinet.....G. Jacobs
Binder, File.....J. C. Dawson
Binder, Loose-leaf.....J. C. Dawson
Blowing-engine.....G. B. Petsche
Boiler.....P. A. Deasy
Boiler-blower.....E. B. Barnhill
Boiler-flue-work apparatus..C. A. Anderson
Boiler furnace, Steam.....G. S. Gallagher
Boiler-tube cleaner.....F. E. Carlson
Bolt.....E. K. Thomas
Bolt.....L. J. Nelson
Book and cover therefor, Score.....A. S. Hendry
Book, Loose-leaf.....J. C. Dawson
Book, Loose-leaf credit.....E. H. Cooper
Boot and shoe.....F. W. Savage
Boot, Waterproof.....F. W. Savage

Boring-machine.....F. Fischer
Bottle, Non-refillable.....W. R. McDonald
Bottle-stoppering mechauism..J. H. Brandt
Bottles, Combined stopper and connection for water.....J. J. Honeseker
Bottling-machine.....A. A. Pindstofte
Bottling-machine, Rotary..A. A. Pindstofte
Box.....H. L. Hudson
Box-closure.....A. H. McAllister
Boxes, Machine for attaching fly-strips to .....J. P. Bird
Brake-beam.....F. R. Cornwall
Brake-shoe.....J. Stromeyer
Breeches, Riding.....C. J. Larkin
Brick-kiln.....E. H. Bradley
Builder's apparatus..2 pats.....J. Daisley
Butter-cutter.....F. Hostetter
Butter-making machine.....R. Montague
Button-making machine.....J. M. Sherwig et al
Cabinet, Book.....R. M. Hooker
Calcium carbid, Making..H. L. Hartenstein
Calculating device.....M. T. Joy
Calipers.....H. Sauter
Camera, Photographic pocket...A. Boreux
Can-body-making machine.....L. C. Sharp
Can-opener.....N. Simmons
Cap or cover.....J. M. Collins
Car brake, Railway....C. H. Howard et al
Car-coupling.....J. E. Henry
Car draft-rigging, Railway....A. Wackman
Car, Dump.....R. W. Davies
Car, Dumping.....T. P. Roberts
Car grain-door, Railway.....J. J. Sands
Car-loading apparatus.....M. C. Volk
Car locking mechanism, Railway-dump.....C. W. Russell
Car-panel with movable sash.....S. M. Curwen
Car, Registering-turnstile passenger railway.....C. W. Cranmer
Car-roof.....E. Posson
Car sand-box.....M. B. Hall
Car-vestibule-diaphragm spring.....F. G. Fowler
Carbonaceous briquet.....T. Davis
Carbonaceous briquets, Binder for.....T. Davis
Carding-machine feed-roll stop-motion.....O. J. Whithead
Carding-machines, Doffer or knocking-off apparatus for the doffer rollers of.....R. Koref
Cartridge-adapter.....J. E. Worrell
Caster.....G. W. Bent
Caster, Ball-bearing.....B. Turner
Casting-mold.....J. K. Dimmick
Catch.....A. E. Waller
Cellulose, Manufacturing.....A. Deiss
Cement-applying machine.....W. F. Lautenschlager
Cement-block-molding machine.....L. J. Kalvig
Cement-watering-tank mold....S. McAdam
Chair or stool.....R. L. Hileman
Chaplet.....J. P. McCoy
Checkrein-holder.....H. W. McIntire
Chimney-flue cleaner.....I. I. Oinm
Chimney-helmet for good draft and weather protection.....W. Holm
Chisel.....C. W. Thompson et al
Christmas-tree-lighting means.....E. J. Burmiller
Chuck..2 pats.....L. E. Whiton
Chuck.....H. F. Neumeyer
Churn.....J. Life
Circuit-breaker, Automatic magnetic.....W. M. Scott
Circuit-controlling devices, Operating means for.....J. K. Lux
Circuit detector, Short.....F. C. Reineking
Clamp.....G. A. Carlson
Clod-crusher.....J. S. Donnelly
Cloth dampening and shrinking machine.....R. M. Dangleish
Clutch and power-transmitting device.....F. M. Prather
Clutch, Axle.....R. C. Feile
Clutch, Friction.....H. J. Wells
Cultch, Friction.....G. Franc
Coal or the like, Machine for leveling.....F. Barnett et al
Cock, Ball.....C. H. Atkins
Collars and analogous articles, Apparatus for reshaping..2 pats....L. V. Estes et al
Coke drawer and loader.....F. D. Buffum
Collars, Stay for lace and other soft.....H. Edmonds
Coloring-matter from titaniferous iron minerals, Manufacture of.....P. Farup
Comb-cleaner.....W. P. Smith
Condenser.....T. D. Fallon
Conduit-threading device.....F. Crawford
Cooker, Steam.....L. E. Daniels
Cookers, Heat-accumulator for fireless.....J. W. Myers
Cooking utensil.....C. McGill
Copy-holder.....J. A. Murray
Core-bar-pulling and core-cutting apparatus 2 pats.....J. R. McWane
Core-support, Portable..J. R. McWane et al
Corn-husker.....R. H. Atkison
Corn tester, Seed.....R. Hales
Cornet.....H. G. Neely
Cotton-chopper.....B. J. Lowman
Cotton-picker.....F. J. Briggs
Cotton-scraper.....O. L. Ekwurzel et al
Couch or bed.....J. W. S. and W. P. Jones
Cream-separator, Siphon.....T. Yamashita
Curd-cutting machine.....L. D. Oakes
Current-wheel.....J. W. Ziegler
Cut-off, Automatic.....P. S. Capel
Decorating machine, Ceramic.....W. Silverman
Disinfector, Centrifugal.....J. Ogden et al
Disk-mount.....W. G. Danielsen
Door-check.....G. R. Martin et al
Door check and closer.....H. Knapp
Door fastener, Barn.....J. B. W. Cole
Door-holder.....E. W. Hasenpflug
Door-lock.....E. Poferl
Door-lock, Mortise.....D. W. Weed
Door-switch operator.....J. G. Peterson
Draft-gearing.....J. F. Courson
Draft-rigging, Friction.....W. H. Miner
Drafting instrument.....D. J. Kelsey
Drawing-press.....W. Klocke
Drier.....G. R. Ruffin
Drying apparatus.....E. Lowi
Drying-machine, Centrifugal.....W. C. Mitchell
Drying proofed and like fabrics or material, Apparatus for.....J. Spenle
Drills, Air-feed for.....M. Hardsoeg
Drilling-machine.....C. B. Richards
Drumhead-tightener.....I. H. Sapp
Dust-collector tubes, Machine for cleaning .....D. G. Becker
Dye and making same, Orange sulfur.....A. Schaarsehmidt
Dynamo brush-holder.....E. C. Ketchum
Educational implement....E. A. Richardson
Egg-separator.....G. E. Lewis
Eggs and whipping cream, Device for beating.....B. F. Fowler
Electric cable.....G. Bartels
Electric circuits, Controlling means for.....J. K. Lux
Electric service-meter.....O. C. Dennis
Electrical-distribution system.....W. H. Clarke
Electrical protective apparatus.....F. B. Cook
Electromagnetic separator...F. J. Phillips
Elevator.....C. C. Rittenhouse
Embalming instrument.....R. T. Payne
Embroidery-hoop.....G. J. Lang
Engine current-controlling mechanism, Internal-combustion.....L. T. Rhoades
Engine rebounding ignition and spacer device, Explosive.....S. D. Field
Engine speed-regulator, Explosive.....P. Langer
Engines, Means for cooling the cylinders of internal-combustion.....L. Durand
Envelop, Safety.....S. H. Loeffler
Expansion-bolt.....J. H. Baker
Explosive-engine.....G. A. Parker
Extensible seat or the like....W. Dudley
Fastener.....O. R. Heaton
Fastener.....L. M. Smiley
Fastening device for edgewise-moving closures and the like.....D. Schuyler
Faucet.....W. Gowie
Feathering-machine.....G. J. Kilb et al
Feed-mechanism-controlling device..2 pats.....R. Zahn
Feed-regulator.....W. Heyser
Feeder and fountain, Automatic.....H. H. Grant
Feeder, Calf.....H. C. Berry et al
Feeder, Stock.....A. J. and C. Harris
Fence machine, Wire.....C. L. Payne
Fence post and bracer, Line and corner...S. F. Webb
Filament for incandescent-gas-lamp mantles.....R. Laigle
Filter.....H. V. Holman
Filter.....A. Steinkoenig
Fire-escape.....J. W. Huff
Fire-extinguishing apparatus...J. W. Babb
Firearm.....F. M. Slawter
Fishing-hook keeper, Snood..C. G. Shannon
Flanges on demountable rims, Means for locking detachable.....A. Dow
Float.....B. O. Tilden
Floor-scraper.....L. S. Starrett
Flower-support.....J. E. Matthewson
Fly-catching-paper holder.....H. Pieper
Footwear-former.....C. S. Huntington
Forms, Making garment....E. Kasralowicz
Foundry plants, Bogie or truck for pipe..F. Herbert
Fowl drinking-fountain.....G. V. Sandle
Framing device.....N. P. Park
Furnace cleavage-bar.....H. S. Wells et al
Furnace-door-operating mechanism.....S. D. Rosenfelt et al
Furniture.....J. F. Lindley, Jr.
Fuse cut-out, Multiple.....C. Almas
Gage and cutter mechanism, Combined....W. G. Perkins
Gage-guard.....P. G. Olson
Gambrel.....R. G. Shelter
Game apparatus.....P. B. Atkins
Garment-creaser.....R. K. Aselstine et al
Garment-waistband adjuster...E. Holdgate
Gas-burner.....L. C. Hiller
Gas-lighting device, Electrical.....E. R. Joseph
Gas or electric lighting fixture.....C. E. Ummach
Gas-plate.....H. W. Schulze
Gas-producer.....W. Thomas
Gas-tank.....H. Watson
Gas-valve, Pressure-controlled.....F. B. Shuster
Gases, Liquefying.....G. Claude
Gaseous mixtures into their elements, Separation of.....G. Claude et al
Gaskets, Manufacturing.....J. M. Towne
Gate-controlling mechanism, Head.....P. M. Fogg
Gear-cutting machine and cutters.....T. Greenwood
Gearing, Driving and reversing.....O. C. Frick
Glass articles, Device for dipping cut.....F. G. Farnham
Glass-drawing machines, Method and apparatus for tempering the sheet source in sheet..2 pats.....I. W. Colburn
Glass, Method of and machine for making wire.....N. Franzen
Glass-press.....W. S. Graham
Glass-taking apparatus.....W. D. Keefer
Glassware.....O. A. Mygatt
Governor mechanism for internal-combustion engines.....F. T. Flinchbaugh
Grain, hay, and manure loader.....E. Erickson
Grain-heater regulator.....A. J. Koegler
Grain-separator straw-rack....W. Koester
Grapple.....R. T. Jones
Grate and protector, Water.....J. G. B. Johnson
Grinding machine or the like, Gear.....W. F. Wagner
Gumming mechanism.....E. H. Taylor
Gun, Trap.....W. M. Lindsey
Gun, Trick.....I. A. Mamaux
Gutter-hanger.....W. A. Williams
Ham and sausage tying machine.....G. Hoefer et al
Hammer, Power.....H. Alinder
Handle.....S. K. Williams
Harrow, Revolviug.....L. E. Waterman
Harvester for onions and the like.....J. W. Linn et al
Harvesting-bag.....J. E. Wood
Harvesting machine, Flax.....J. H. Philipp et al
Hat-fastener.....J. P. Bartos
Hat-fastener.....A. W. Stonestreet
Hat-fastening device....R. F. Van Heusen
Hat, Hygienic.....D. J. Roberts
Hay-distributer.....N. C. Miller
Hay-press feeder.....L. B. Wygant
Hay-rack.....J. G. Bailey
Hay-rack, Folding.....N. M. Rosier
Hay-rack, Self-loading.....R. Shock
Head-rest.....J. H. Atkin
Heading-machine.....J. E. Johnston
Headlight, Revolving.....J. H. Clark
Heel and sole edge waxing machine.....T. G. Plant
Heel for boots and shoes, Detachable revolving.....L. F. Keijser
Heel or sole edge waxing machine.....T. G. Plant
Heel-rand-making machine....A. C. Heath
Hog-grapple.....W. D. Farrell
Holder and centering-tool, Combined.....G. F. Wegner
Horse interfering-boot....A. Schwemberger
Horseshoe.....J. H. Kieffer
Horseshoe blanks, Machine for creasing and punching.....J. H. Taylor
Hose-coupling.....H. E. Kittredge
Hose-holder.....L. A. Trope
Hose-wheel, Valve-operating.....I. E. Williams
Hot-air furnace.....J. Akerstream et al
Hot-air register.....G. G. Lewis
House-cooling apparatus.....M. Leblanc
Hub, Balanced wheel....L. E. Sturdevant
Hydroxyl derivatives of aromatic hydrocarbons soluble in water, Rendering.....A. Friedlaender
Ice-cream freezer.....T. J. Hartou
Ice-cream freezer.....M. M. Dickinson
Indnctance coil, Variable self..J. R. Jesse
Initiating-machine.....I. A. Mamaux
Ink-pad.....J. Raven, Jr.
Insole, Spring.....R. W. Morgan
Insulating-conduit for electric wires or conductors.....A. P. Hinsky
Insulating-tubes, Manufacture of.....M. Meirowsky
Insulator-protecting apparatus..2 pats....L. C. Nicholson
Insulators, Attachment of telegraph and similar line wires to.....W. E. Brandfield
Interest-bearing instrument, Negotiable...J. E. Hanzlik
Internal-combustion engine.....J. A. Nickelson
Internal-combustion engine.....S. Wiebe
Internal-combustion engine.....P. V. Woodward
Internal-combustion motor or engine.....H. W. Rowing et al
Jarring-machine.....E. Killing
Jaw-trap.....H. Sigman
Journal-bearing.....J. E. Yeager
Keg-spout.....W. A. Alkire
Kitchen implement.....F. Wagner
Knee-cushion.....H. Ehikian
Knitting-machine feeding device.....J. Rogginger
Knitting-machine yarn-guide-controlling mechanism, Traverse-warp..G. S. Weeper
Knitting-machine yarn-splicing device.....H. A. Houseman
Labeling-machine.....E. S. Miller
Labeling machines, Wiper for bottle.....E. Ermold
Lace-fastener.....C. B. Smith
Ladder brace and bracket.....L. M. Norton
Ladder, Extension fire.....J. Dupuis
Lamp, Incandescent.....C. I. Dodson
Lamp-receptacle, Series.....C. D. Gervin
Lamp socket and securing means therefor, Electric.....W. C. Tregoning
Lamp socket-support, Electric.....W. C. Tregoning
Lamps, Manufacturing incandescent.....R. K. Mickey
Lamps, Manufacturing the hooks intended to support the filaments of electric incandescent.....P. G. Triquet
Lantern-holder.....F. Connarn
Latch.....W. R. Carson
Latch, Gate.....J. A. Reed
Lathe-center grinder.....P. Gommel
Lathe-tool holder.....H. Nielson
Legging.....G. Ciaciola
Lens-grinding machine...M. W. Brinkmann
Lifting-jack.....C. E. Hylander
Lighting apparatus.....E. Seitz
Lightning-arrester.....F. P. H. Knight
Liquid-fuel burner..2 pats.....W. R. Montgomery
Liquid-fuel burner.....C. W. Weiss
Lock.....G. Schwob
Locks, Removable dial for permutation....C. E. Blechschmidt
Locomotive.....J. F. Beck
Log-carrier trip-hook.....J. B. Goode
Log-conveying device..2 pats....O. Torseth
Loom.....B. F. McGuiness
Loom-filling-feeder, Filling-replenishing....E. S. Stimpson
Loom friction let-off.....H. Duval
Loom harness stop-motion..L. H. Holcomb
Loom harness stop-motion.....G. E. Whitehead
Loom lug-strap.....W. H. Dismuke et al
Loom shedding mechanism.....A. A. Gordon, Jr.
Loom-shuttle.....H. A. Titus
Lubricant.....E. G. Acheson
Lumber-dipping device.....W. L. Baten
Lumber-finishing machine.....F. G. Price
Magnifying instruments, Eyepiece for.....J. N. Arriaga
Mail-bag.....C. E. Liucoln
Mail-chute.....E. A. Knmming
Mail-crane.....F. H. Hall
Mail-handling device.....J. H. Buchanau
Malt as well as grinding washed and steeped malt, Washiug and steeping.....A. Hansen
Malt-kiln.....J. F. Dorufield
Mandrel, Expansion.....A. Jefferys
Marking machine, Lumber.....V. Varin
Marking textile fabrics, Mechanism for inking the marking-type of machines for..H. Higgin
Mattress-filler.....P. G. Mayhew
Measuring instrnment, Portable electrical..W. E. Beede
Measuring-machine.....J. F. Teehan
Measuring machine, Grain.....H. Ray
Medicament and making the same.....A. D. Barr
Medicament and producing the same.....A. D. Barr
Medicaments, Producing.....A. D. Barr
Mercury-dropper, Automatic.....E. C. Ketchum
Metal wall, Flexible corrugated.....W. M. Fulton
Metal-workiug machinery, Stroke-adjusting means in.....N. B. Chace et al
Metallic-fabric-assembling machine.....J. F. Gail
Metallic structure..M. and L. S. Lachman
Metallic tie.....R. A. Finley et al
Milking apparatus.....F. B. Shafer
Mitt, Base-ball.....J. Gamble
Mixing-machine.....P. T. Arnold
Mixing-machine.....H. Read
Mold.....J. H. Smith
Mold.....H. Gasche et al
Molding apparatus.....O. F. Paehlke
Molding double-headed chaplets and other articles.....F. P. Johness
Molding-machine.....J. L. Hunter
Money-changing device.....E. D. Hale
Monoplane.....E. H. Boeckh
Mop-holder.....R. Kline
Motor.....G. E. W. Luehrmann
Motor-control system.....S. H. Keefer
Motors, Governor for spring....G. Wodtli
Mower cutting-reel, Lawn....G. A. Culver
Nickel and copper from mattes, Separating.....D. P. Shuler
Nut-lock and washer, Combined.....J. F. McGee
Oil-burner.....A. J. Garloff
Oil-burner.....B. F. McMahon
Oil-burner.....H. L. Wadley
Oiler, Hand.....W. Rubly
Orchard-heater.....W. H. Edwards et al
Ore concentrator.....G. W. Burnhart
Ore-screen.....F. Franz
Oven, Baker's.....L. McDaniels
Package-forming machine....J. P. Wright
Packing.....L. Katzenstein
Paper-box blanks, Piecing-machine for.....C. W. Hobbs
Paper-box-making machine..E. H. Taylor
Paper holder, Fly.....M. Brahaw
Pasteurizing apparatus.....A. Tiesse
Peanuts in the shell, Salting.....F. and H. Baker
Pen and seal, Combined.....J. V. Mitchell
Pencil.....C. A. Smith
Perch for fowls.....J. D. Carmichael
Percolator-pot.....J. W. Chapman
Phonograph-recording mandrel-sleeve.....W. C. Runge
Photographic apparatus....J. Leonard et al
Photographic developing-rack..W. H. Depp
Photoprinting-cabinet, Automatically-operating variable-time-exposure....J. F. Ware
Photoprinting-cabinets, Resiliently-cushioned printing-frame for.....J. F. Ware
Piano.....W. L. Bjur
Piano-action.....I. F. Gilmore
Piano-playing mechanism.....H. F. Goldsmith
Pin and joint.....E. A. Phinney
Pipe-coupling.....A. Lang
Pipe-pit.....J. R. McWane
Planter, Corn.....A. P. Guhrud
Plow.....W. G. Danielsen
Plow.....L. E. Waterman
Plow, Reversible.....J. W. Buchanan
Plow-shovel.....C. E. Allen
Plow, Sulky.....C. R. Davis
Plow, Wheeled.....L. E. Waterman
Poke, Animal.....C. C. Babb
Pole-base.....A. B. Cook et al
Pool and billiard table ball-frame.....B. N. Hutzel
Power from the explosion of gases, Deriving.....E. P. Dawson
Power-transmission apparatus.....D. E. Selders
Pressure-gage, Recording.....E. H. Bristol
Printing-machine keyboard mechanism.....E. A. Adcock
Printing-press tympan mechanism.....M. A. Droitcour
Projectile.....H. H. Hendrix
Propeller.....J. Turner
Propeller, Screw.....C. Coma
Pulley.....H. J. Gilbert
Pulp-lap-forming machine..J. P. McCready
Pulp pipe, Manufacturing..S. R. Bradley
Pulverizer, Disk.....F. M. Iler
Pulverizing-mill.....W. H. Lieber
Pump.....C. Comstock
Pump.....W. H. W. Hamilton
Pump for internal-combustion engines, Automatic.....R. W. J. Smith
Pump priming and venting apparatus, Water.....A. Blauvelt
Pumping oil-wells, Method of and apparatus for.....A. Sattler
Punch press, Multiple.....F. Thompson
Punching and riveting machine.....G. Whiting et al
Punching-press.....W. Johnson
Radiator.....F. Todd
Rail-clamp.....W. Berry et al
Rail drilling and reaming machine.....H. W. Jacobs
Rail-joint.....A. J. Bartell

Rail-joint.....E. Posson
Railway-rail fastening for railway-ties.....R. T. Kirkland
Railway road-bed.....R. Mobley
Railway-switch-operating mechanism.....E. D. Rose
Railway-switch safety appliance.....J. W. McManama
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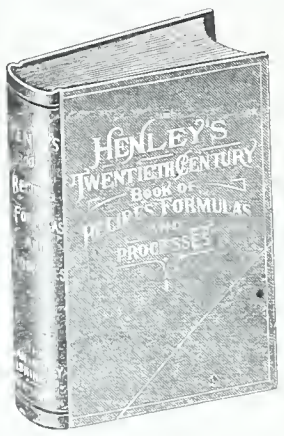

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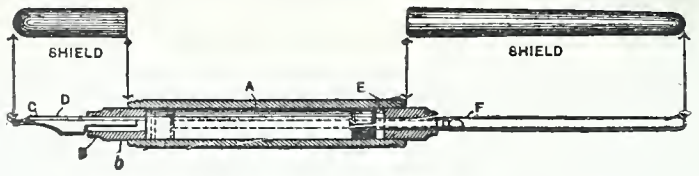

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ERECTING THE DUNBARTON POINT BRIDGE.

By FRANK C. PERKINS.

A UNIQUE method of erecting the fixed spans of a draw bridge is indicated in the accompanying illustrations, one showing a floating span being towed into position, and the other the fixed spans in place in the bridge.

Bridges are usually constructed piece by piece; but in this case, spans were made complete and then transferred to their place. This bridge of the Central California Railway across the lower end of San Francisco Bay had a draw span of 310 feet, with three fixed spans at both ends, each of 180 feet, of double track construction, the channel being in all about 1500 feet wide. The six fixed spans were constructed in pairs on a temporary false work, so arranged that two scows could be floated under each span in the openings secured by removing the temporary trusses. Two more spans were then erected after the completed ones floated off, and the timber trusses replaced.

An old car ferry, measuring 248 feet in length, was cut in two at the middle and bulk heads fixed at the ends, two hulls being provided in this way for floating the spans into place during the erection of the bridge. There were five compartments provided in each of these hulls, arranged with sea-valves to permit water to enter the same when the fixed spans were lowered into place.

This draw bridge was designed and constructed under the direction of Chief Engineer William Hood, of the Southern Pacific Company to whom the writer is indebted for the accompanying illustrations and data. In this unique method of erection, as soon as a steel span was completed and ready to be placed in position, the two hulls or scows were floated under the span at low tide, lifting the same from the temporary false work as the tide rose, when it was towed by a tug to its final position. The ends of the hulls were lashed together in order to prevent them from spreading, and it required an average of about one and a half hours to tow them with their load of 461 tons from the temporary false work and lower them into their position at the permanent site. From the central pier the draw span was erected as a canti-lever bridge over its permanent protection, constructed in the usual manner.

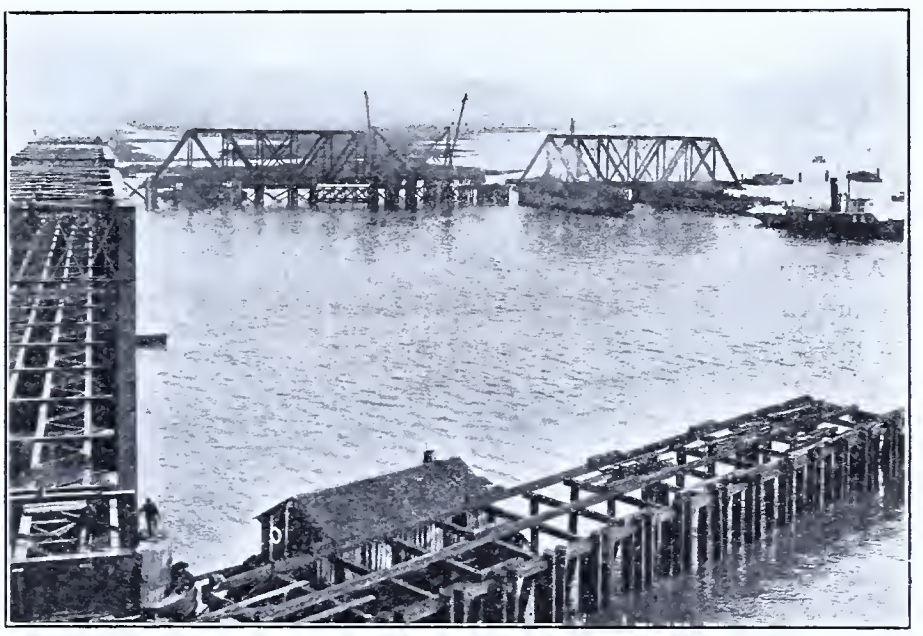


FIG. 1.—FLOATING SPAN INTO POSITION ON DUNBARTON POINT BRIDGE.

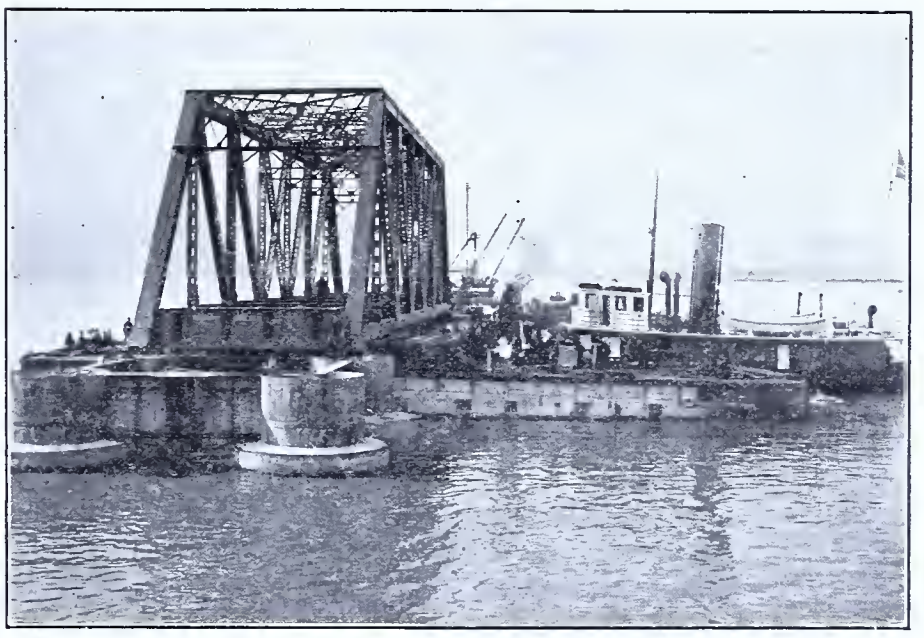


FIG. 2.—WITHDRAWING BARGES FROM UNDER FLOATING SPAN AFTER IT IS LOWERED INTO PLACE.

By filling the compartments of the hulls with water and by opening the sea-valves, the fixed spans were easily and accurately lowered to their bridge seats without the slightest difficulty. This filling of the hulls was the only means used in bringing the spans into their fixed positions and only a very short time was required for this work, the fall of tide not being utilized. When the spans were in place, the hulls, or barges, were allowed to sink a little deeper, and were then withdrawn by the tug.

It is stated that the extreme high tide was 108.6 feet and the extreme low tide 95.6 feet, while the mean high tide was 106.6 feet and the mean low tide 100.6 feet. The water at the middle of the channel is about 50 feet deep at low tide, the extreme variation being 11.7 feet.

On both sides of the channel there are long stretches of flat low salt marshes, timber pile trestle approaches 8,000 feet in length being provided. The fixed spans rest at each end on pairs of concrete cylinders consisting of steel shells sunk below the bottom of the channel and resting on a foundation of timber piles driven inside the shells to a depth of about 30 feet below the bottom of the cyl-

inders. Above the water line heavy steel girders connect the piers in each group, the ends of the girders being fixed to the steel shell of the pier and embedded in the concrete, thus forming a most substantial and permanent construction. It is maintained that the Dunbarton Point Bridge will meet all the requirements of the deep water and swift current conditions at the lower end of San Francisco Bay.

Across the Atlantic With a Thimble Battery.

In no other respect is the contrast between wireless and submarine telegraphy more striking than in the the amount of electrical energy required for transmitting messages over the same distance. Being so constructed as to send out the waves in almost all directions besides the particular one for which the message is intended, an ordinary wireless outfit must imply a tremendous waste of energy as compared with the ocean cable in which the current is all concentrated in one delicate receiving mechanism. So delicate is the latter that the messages have been sent not only across the Atlantic, but for double the length of the oldest Atlantic cable, with the current from a silver thimble battery.

An article in *Popular Electricity* quotes from a letter of the famous electrical engineer, Latimer Clark, written forty-five years ago: "With a single galvanic cell composed of a few drops of acid in a silver thimble and a fragment of zinc weighing a grain or two, conversation may be carried on through the cables crossing the Atlantic. And although the spark, twice traversing the breadth of the ocean, has to pass through 3700 miles of cable, its effects at the receiving end are visible in the galvanometer in a little more than a second after contact is made with the battery."

Of course every forward step toward concentrating or directioning the wireless waves will reduce the energy required for transmitting messages by the same, but we evidently have a long way to advance before our wireless methods can be at all compared in efficiency with the submarine telegraph of even 45 years ago.

Automobile Sleighs.

In the race for the South Pole in which several nations are about to engage, automobile sleighs will figure as part of the equipment. One of the newest types of autosleds has no roller or wheel to drive it off the ground, but is moved simply by the back thrust from the air produced by rapidly rotating screws. The same movement takes place in a screw steamboat. The inventor of this device is an aeronaut, who applied the system of propelling airships to his sleigh. The guiding is also done in a novel way. Behind the runners are rudder-like affairs, shifted to right or left by rods and levers fastened to the inclined steering wheel. The sleigh answers at once to a slight movement of these rudders, allowing even sharp angles.

Locating Ships in Fog.

Collisions in a fog are the most imminent danger to voyagers on the ocean, and science has long grappled with the problem in vain. Radio-telegraphy has now been enlisted in the struggle, and there is a chance that the peril will be greatly diminished. Two Italian naval officers have invented a device which they claim will prevent collisions. The visible portion of this invention consists of a recorder having the form and appearance of a compass dial. Near the latter is a thumb bar that influences the dial indicator, and when manipuated causes the indicator to revolve over the dial's surface and mark the point of the compass from which an approaching ship is coming, giving its exact location and distance away. About the skipper's ears are strapped a pair of the ordinary wireless telegraph receivers, and by means of these he is able to hear the sound given off by the wireless apparatus of the approacbing ship. The operator manipulates the thumb bar until the wireless sound is at its highest pitch, when a reading of the dial face and indicator gives him the exact position of the vessel or shore wireless station from which the sound comes. For this instrument to be effective, of course, it is necessary for the approaching ship to be equipped with wireless apparatus, and have it sending off the waves at the time the test with the instrument is made on the other ship.

A Lamp That is Alive.

Many substances of organic origin, such as meat at a state of incipient decay, putrescent wood and withering leaves, as is well known, give out a strange light visible to the human eye. Glow worms and fire flies are also known to be endowed with luminosity. Tribes in the tropics often use glowing beetles as bait in catching fish, and as optical telegraphs in warfare. By rubbing their faces with such beetles, they produce luminous masks, hideous and ghastly in their wierd effects. Recent studies of the luminosity of organic substances have shown it to be due to bacteria on the surface. These are readily transmitted from one substance to another, and the glow thus produced constitutes a real vital process. Fungi are permanently luminous, and bacteria cultures keep their capacity for shining for months. The idea thus suggested itself to use this living light in the construction of lamps. A Prague professor filled a glass tube with sterilized gelatine, which, after congelation, was vaccinated with bacteria culture. Such plentiful colonies developed inside the bulb that the latter soon gave out a beautiful bluish light. The intensity of this light is lower than that of a a candle, but it suffices for use as a night lamp, and for photographic purposes. The main difference between living and artificial light is the absence of heat rays. Nature thus long ago found the solution of a problem that has puzzled our engineers, that is, to produce light without heat.

NEW BOOKS.

Model Balloons and Flying Machines.

By J. H. ALEXANDER, M. B., A.I E.E.
Published by Norman W. Henley Co., New York.

The successful flights which are being carried out everywhere with heavier than air machines, are causing great attention to be devoted to the study of aeronautics and aviation. Scientific men now consider that mechanical flight is practical, and the person who experiments in this direction is no longer looked upon as a crack-brained enthusiast trying to discover the impossible. While inventors are busy, makers are vying with each other as to who shall construct the most successful flying machine. It is expensive to build a full sized machine and carry out experiments with it, and unless the would-be aviator is wealthy, and at the same time willing to risk his life, he must content himself with experimenting with models. It is admitted that small scale experiments are as applicable to the design of flying machines as to sea going ships. In both cases the model and its counterpart can be compared by Froude's law of comparison. This book has been written with a view to assist those who desire to construct a model airship or flying machine. It contains five folding plates of working drawings, each sheet covering a different size machine. Much instruction and amusement can be obtained from the making and flying of these models. A short account of the progress of aviation is included, and illustrations of flying machines of the latest type are scattered throughout the text.

Concrete Workers' Reference Books.

Concrete Wall Forms, and Concrete Floors and Sidewalks.

By A. A. HOUGHTON,
Published by Norman W. Henley Co., New York.

These two books are part of a series of practical monographs on popular concrete subjects. It is the purpose of the author to present not only the usual types of construction but to fully explain molds and systems that are not patented, though equal in value to those so protected. These molds are easily and cheaply constructed, and embody simplicity, rapidity of operation and the most successful results in the molded concrete. The first treats of an automatic wall clamp, in which the lifting of the forms causes the core mold to collapse and the outside wall molds to draw away from the concrete. When lowered into position again, the forms are automatically locked, ready for filling. This is easily and cheaply made, and other types of wall forms, centering clamps, separators, etc. are illustrated.

The second explains the construction of squares, hexagonal and other forms of mosaic floor and sidewalk blocks or tiling. The construction of floor slabs, etc. with reinforcements and molds for the same, is described. The subject of plain and ornamental floors and finishes is so completely treated that this book will be of great value to everyone having occasion to use concrete.

WIRELESS TELEPHONES

By J. ERSKINE MURRAY, D. Sc.
Published by Norman W. Henley Co., New York.

It was in the last year of the last century that the first experiments in radio-telephony were carried out, but it was not until some years later that an apparatus was evolved capable of transmitting speech distinctly to a distance of ten miles or more. It was thus about three years ago that wireless telephony entered the arena of every day life as a practical means of communication, though even now few people are aware that the voice can be transmitted without wires so as to be audible in a receiver several hundred miles away. These achievements indicate a very important step in that progressive annibilation of space which nowadays renders social and business intercourse possible over thousands of miles of sea and land. A practical treatise on the subject is the book above mentioned. It is free from elaborate details, and aims to give a clear survey of the way in which wireless telephones work, including a discussion of the methods and instruments used. Speech, it notes, can be transmitted by wire overland to a distance of between one and two thousand miles, but across the sea, by submarine cable, the maximum is little greater than one hundred miles. The wireless has already outdistanced the cable, over sea, and speech has become possible at much greater distance than heretofore. There is every reason to believe that where wireless telegraphy leads, wireless telephony will be able to follow, and that speech will become audible across the ocean. This method of telephony is an accomplished fact, and when we consider that in thirty years the number of telephone subscribers in the world has grown from nil to a vast total af over two millions, it is clear that this means of electric communication fulfils the needs of every day business and social life far more perfectly than the telegraph, and that it will play, from now on, a part of immense value in the intercourse of all civilized communities.

STANDARD PRACTICAL PLUMBING.

By R. M. STARBUCK,
Published by Norman W. Henley Co., New York.

The intention of the author in presenting this work has been to produce something in the nature of a text book, which should not only appeal to the beginner as a work of instruction, but to his more advanced brother as a book of reference. The early pages take up the manual work of the plumber, following which come several chapters on the various phases of trapping, venting and drainage, and then several on important classes of plumbing construction. The latter part of the work is devoted to the general subject of hot and cold water supply, and to several special topics, including mechanical drawing. As generally applied today, the word plumbing includes not only the drainage and vent systems, which in reality are parts of the same system, but also the water supply. Originally by the word "plumber" was meant a lead worker, but the common significance of the term is now entirely different. Both the drainage and water supply systems have in the past undergone great changes, and further improvements may be looked for in the future. The book contains three hundred and forty-seven illustrations, and in its exhaustive treatment of the subject, it commends itself to every one working in any branch of the trade.

ALUMINUM WELDING.

It is well known the reduced cost of aluminum has contributed greatly to the rapidly increasing use of the metal in competition with copper for electrical purposes. One of the greatest obstacles to its extensive employment, however, has been the difficulty of obtaining a sound mechanical joint. In the United States, metal sleeves have been used to hold together the cable ends, but it is said that they do not afford a sound electrical joint owing to the oxidation of the aluminum surface where it comes in contact with the metal sleeve.

FIG. 1.

Attempts have been made to weld aluminum electrically, but the weld was found to be brittle, and the strength of the metal was reduced considerably, in some cases as much as ten per cent. The difficulty—if not impossibility—of soldering aluminum is due to the formation of an imperceptible, but very persistent film of oxide on the surface of the metal. This film of oxide cannot be reduced by the use of flux, nor can it be mechanically removed, for, however rapid the removal, a fresh film is instantaneously formed on the new surface, and this prevents the permanent adhesion of the solder.

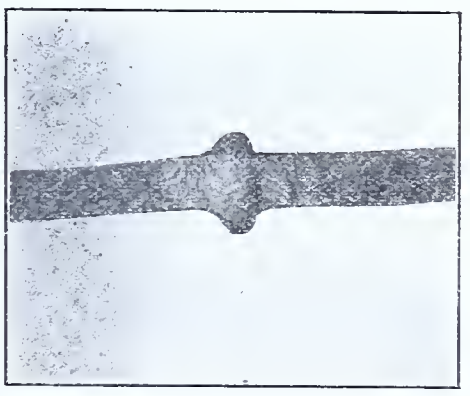


FIG. 2.

Mr. Sherard Cowper-Coles, of London, has made a number of experiments in the welding of aluminum, extending over eight or nine years, and has now perfected a compact patent welding machine, making use of the fact that aluminum readily becomes coated with a film of oxide. The principle underlying the process is as follows: The ends of the rod to be jointed are butted, after facing square, and flame from a gas blowpipe or benzine lamp is applied at the joint, which rapidly produces an oxide skin. The fused metal is retained within this skin of oxide. When the ends of the rods are molten, they are brought rapidly together by releasing a spring catch. the oxide skin bursting at the point of contact, is driven out by the pressure of the spring, and the clean molten metal unites and makes a perfect joint.

Fig. 1. clearly shows the skin of oxide containing the molten aluminum, the weight of which causes the flexible skin of oxide to sag. The envelope, when pierced, allows the molten metal to run out leaving a loose skin as shown in the illustration.

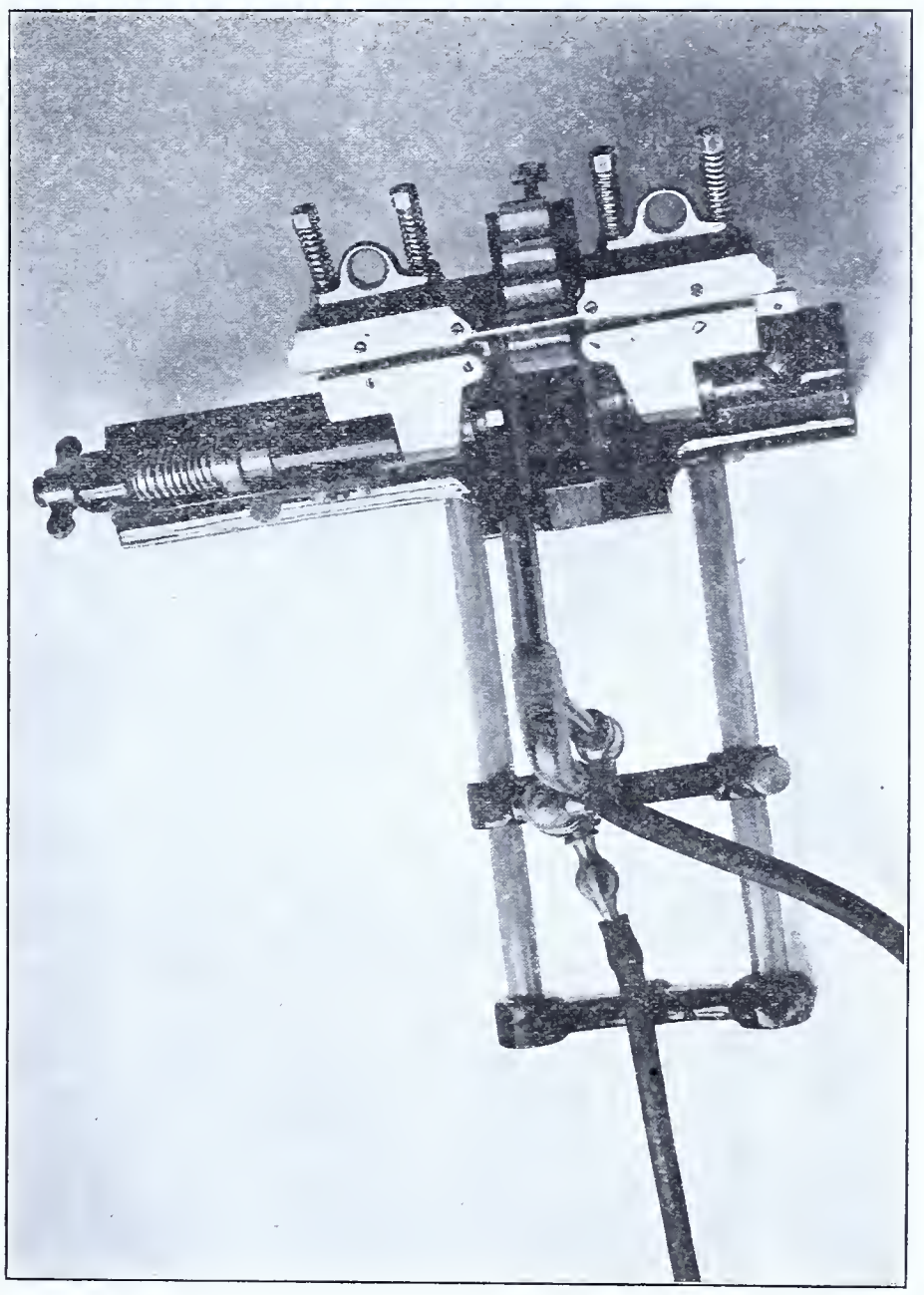


FIG. 3.

The cut (Fig. 2.) shows a joint after welding, the ring of the metal which has been squeezed out is largely composed of aluminum oxide. The joint may be tested after the removal of the collar. It is necessary to remove the collar only when it is desired to obtain a uniform diameter. After welding, the joint is of uniform diameter.

The machine illustrated in Fig. 3. and Fig. 4. is operated by a blowpipe from coal gas. The adjustable spring jaws are lined with a refractory holder so as to insulate the aluminum. The compressed spring and spring release can be clearly seen. and the adjustable stop regulates the movement of the spindle. The blowpipe is fitted with a spring universal joint and can be adjusted in position along the rods, which are detachable so that the machine packs up very closely.

The flame plays on the grooved firebrick, supported on an adjustable inclined plane, which regulates the height to a nicety. by means of the screw.

The machine can be supplied with coal gas power, or with a producer gas blowpipe (made of iron) or with a benzoline lamp for field work, in which case it can be packed in a box 18 inches by 7 inches, weighing only 19 pounds, the complete outfit costing from $50 upwards, according to the size of the welds to be made.

In tests for tensile strength on twelve consecutive welds (not picked specimens) made by the Cowper Coles welding machine, the fractures occured at a considerable distance from the weld, showing that the metal had not deteriorated there. In the tests, not one of the specimens broke in the welded portion.

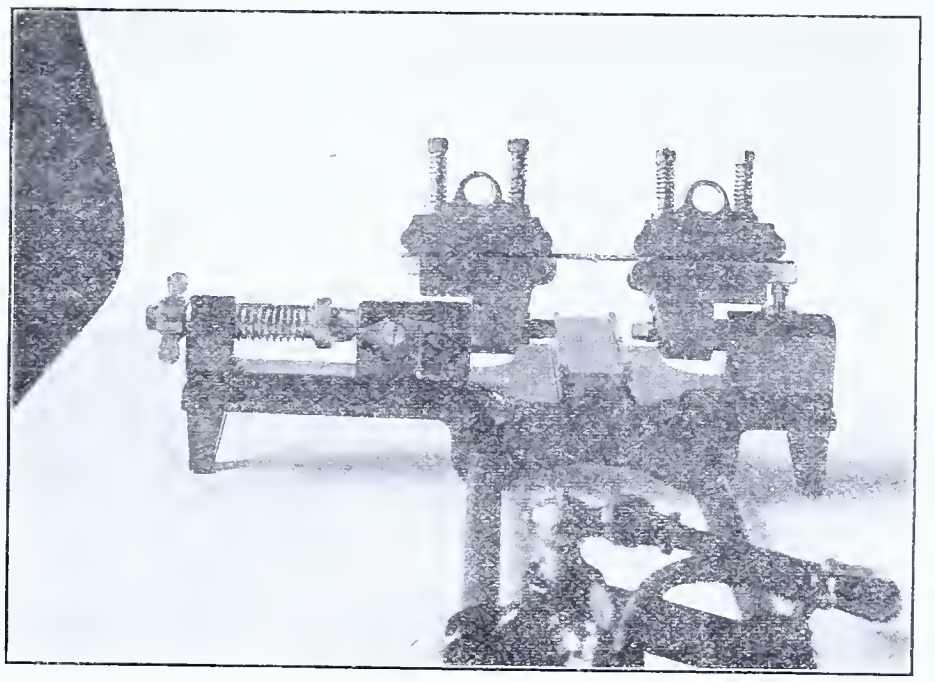


FIG. 4.

Improving Warships.

A number of devices have been recently installed upon Uncle Sam's fleet, which are novel enough to be regarded as revolutionizing the appearance of the ships. Among other things, they were equipped with a new skeleton fire control mast, which had been previously subjected to trial to ascertain the ability of the structure to resist attack. Another improvement was removal of what is known as the tophamper, including emergency cabins, from many of the boats, and the obstructions which impeded movements above deck and added to the target for the enemy's guns, as well as increased the weight to be carried by a vessel. These are a few of the alterations planned to improve naval construction and equipment.

How to Get Copies of Patents.

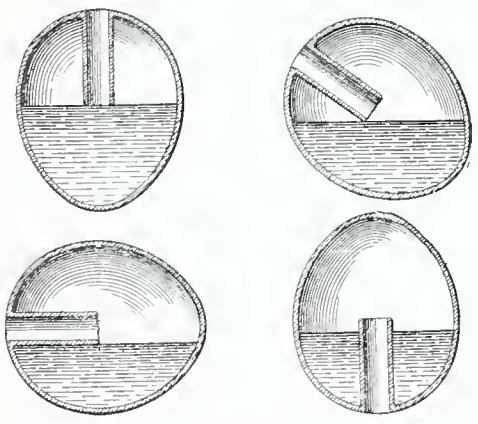
THE INVENTIVE AGE prints each month a list of the patents granted by the Patent Office. This list includes the name of the inventor, the title of the invention and the date of the patent. Anyone can procure through THE INVENTIVE AGE a copy of any patent included in the list, by giving the data and enclosing ten cents in stamps for each copy. There is no better way of keeping yourself informed about the progress of the arts, than by scanning the list each month and ordering copies of patents.

CLEVER NEW PATENTS.

A Fumigator and Perfumer.—Rail Joint.—Suspension Bridge.—Band Cutter for Thrashing Machines.

A Fumigator and Perfumer—For the Home or Farm.

Poultry raisers will find the fumigator covered by patent No. 971,570 of great value in exterminating the mites and lice which infest the nests. When employed for this purpose, the fumigator is constructed in the form of an egg, which, when placed in a nest, serves to keep the same free from vermin. The hollow egg forms a receptacle for containing a fumigating liquid or powder, and is provided with an inwardly extending and open-ended integral tube, the inner end being arranged near the center of the receptacle, and being adapted to permit the passage of the fumes of the liquid or powder, but to prevent the liquid or powder from escaping, irrespective of the position of the egg. Because of its nonporous character—it being made preferably of porcelain or glass and of a single piece—there is no danger of the fumigating liquid or powder coming in contact with what is being fumigated. This will be readily understood from the illustration which shows the egg in four different positions. The fumes arising from the egg, while sufficient for the destruction of the vermin, will not injure the poultry, because the fumes are not dissipated in sufficient quantities to affect the hens harmfully. On the contrary, it has been found in practice to add to their healthful and productive state.



While the receptacle is shown as being egg-shaped, it is capable of other uses, and, when so employed, the container may be spherical or rectangular. When desired to be used for the prevention of moths, the receptacle is filled with powder or liquid obnoxious to them, and then packed away with clothing, and the immunity of the latter from the little white destroyers is assured.

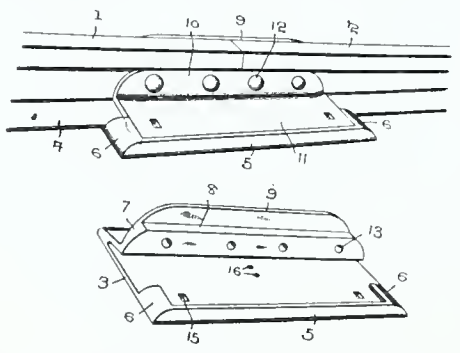
It also forms a cheap and efficient substitute for various sachets and other devices now so generally used for perfuming articles of feminine apparel. Whether either liquid or powder are employed, because of the nonporous character of the container, only the fumes pass out through the tube in their work of perfuming the articles, and the liquid or powder being excluded from the air, retain their strength for a much longer period of time.

In practice, suitable liquid or powder is poured into the receptacle through the inwardly extending tube until the level of the said liquid or powder just closes the open inner end of said tube. The work of fumigating or perfuming then goes on, and the fumes or odor arising from said liquid or powder will readily pass out, the liquid or powder being retained within the receptacle as previously explained.

The device in its varied uses is fully covered by the patent, and the entire rights of the same are now owned by the patentee, William J. Shelton, of Van Vleck, Texas, to whom all inquiries should be addressed.

Rail Joint.

A rail joint that is at once simple and strong, and that is provided with a removable fish plate for the opposite side of the rails, is the recent invention of Gilbert and Milton L. Bacon, of Antigo, Wisc. The plate that supports the rails, indicated by the numeral 3 in the drawing, has a rib 5 at the edge and ribs 6 at its ends, these latter forming shoulders against which the flange 4 rests when placed over the plate. On the opposite edge of the plate is a fish plate 7, with a shoulder 8 to engage the under face of the head of the rail, while above the shoulder the fish plate extends to and is flush with the upper edge of the rail to provide a bearing surface 9. An auxiliary fish plate 10 is on the other side of the rail, and its lower edge has an extension 11, fitting be-

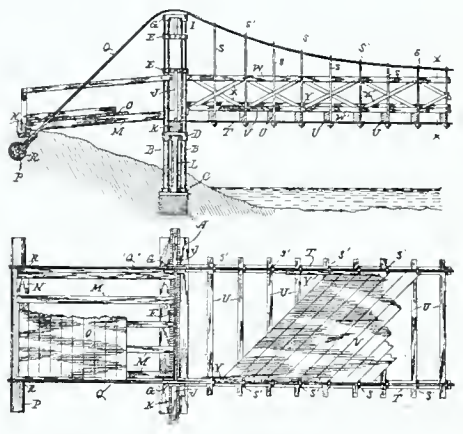


tween the ribs 5 and 6 to hold the plate against endwise movement. The edge of the extension projects beyond the rail flange. this portion being thickened to rest on the base plate 3 and keep the upper face of the extension flush with the top of the ribs, the depending part forming a shoulder for the flange. Bolts lock the fish plates to the rails. Wheels passing over the joint engage the bearing surface 9 of the fish plate 7, thus providing substantially an endless rail and obviating jarring. Openings are provided through the plate 3 below the ends of the rails, to carry off any water, sand, etc. that may enter between the rails and, by freezing, cause the rails to bend. When the bearing surface becomes worn, a new piece may be supplied without dispensing with the base plate and fish plate.

It will be seen that the above forms a very solid connection, braces the rails for the weight of the train, and permits the fish plates to move coincidently with the base plate, thus preventing the bolts and nuts becoming loosened by passing cars.

Suspension Bridge.

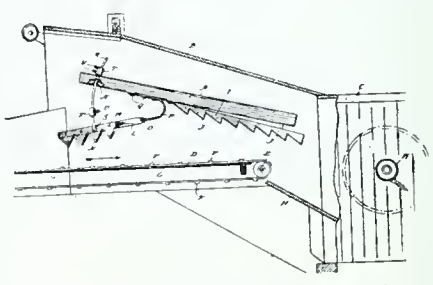
A bridge of novel design, simple and rigid but arranged so as to avoid the vertical motion in the floor of spans of such constructions, and also adapted to be erected without the usual expensive false work, is shown in a patent owned by Wm. H. C. Greer, of Sherman, Texas. As may be seen in the cuts, which represent a side elevation and a plan view of the bridge, the pairs of pillars on opposite sides of the river are made of iron pipe, and the lower ends rest in sockets in sill plates, and are connected by cap plates *D* and tie plates *E*. The towers thus formed are joined by transverse tie bars *F*, braced at top, bottom and middle to hold them rigid. Extending from one tower to the other and resting on the cap plates is a transverse sill *K* with projecting ends; the cap plates being supported intermediately by a short pillar. Longitudinal beams *M* extend from the cap *K* to the shore sill *N*, and hold the flooring *O* of the shore approach.



In the banks of earth beyond the towers are transverse ditches in which are anchors *P*, made of tough logs or of iron; and extending from saddle to saddle *G* of the extension towers are cables *Q*, the shore ends of which are provided with loops through which the anchors pass. *S* designates a series of vertical suspension rods, of round iron, diminishing in length toward the middle of the bridge, and engaging with the cables by hooks. The lower ends of these rods pass through perforations in the metal plates *T* and are then threaded and provided with nuts, so that the plates serve to support the floor beams *U*, which further hold the road bed. Secured to the inner pillars of each tower, one above the other, are angle iron bars *W W*^{1}, extending from tower to tower. *W*^{1} rests on the top side of the floor beams *U* and may be secured thereto, and the bars are tied together by braces. Plates *V* forming copings are arranged along the opposite edges of the roadway and bolted to the floor beams *U*, which with the lattice bracing reduces to a minimum the vertical vibrations of the roadway.

Band Cutter for Thrashing Machines.

A band cutter intended for attachment to the feeding device of a thrashing machine, which is of simple character and will adjust itself automatically to bundles of various sizes, is the invention of Joseph T. Hanson, of Dell Rapids, S. D. The feeder, as shown in the cut herewith, consists of a plurality of beams *A* which reciprocate longitudinally of the throat of the machine, and below these is an endless carrier having spaced transverse slots *F*, which delivers to an inclined plate. Each of the beams has a feeding arm *I*, having a number of notches, the perpendicular faces of the latter fronting the cylinder *K*. When the beams are reciprocated with a rising and falling movement, moving closer to the apron on the inner movement than on the outer, the grain will be moved toward the cylinder and will also be torn apart and loosened to prevent choking. The band cutter consists of a flat bar having bolted to one end sickle blades *N*. A short distance from the inner end of these the bar is turned as at *O* and then curved back as at *P*, and secured to the under face of the beam. An arc shaped rod *R* has an eye through which passes a rivet to pivot the rod to the bar, and the rod extends



through an opening in the bar, and is encircled by sleeves above and below the same, said sleeves being slidable and held in place by set screws. The bar *L* is resilient, and the curved portion acts as a spring to retain the free end as far from the beam as the upper sleeve will permit. By adjusting the upper sleeve, the cutting portion may be moved toward or from the apron in accordance with the size of the bundles. The cutter is normally spring-pressed downwardly toward the carrier. The arc shape of the rod, and its pivotal connection with the bar, permit the said bar to move freely, and at the same time it acts on a guide to prevent lateral movement, and to limit vertical movement.

LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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WESTERN ENGINEERING & CONSTRUCTION CO. et al. v. RISDON IRON & LOCOMOTIVE WORKS.

(Circuit Court of Appeals, Ninth Circuit, Nov. 12, 1909. 174 F. R. p. 224.)

1. PATENTS — CONSTRUCTION OF CLAIMS—GOLD DREDGER.

In the Postlethwaite patent, No. 622,532, for a gold-dredging apparatus, claim 3, which contains as one element of the combination "a perforated spray pipe leading into the separator or grizzly from the lower end thereof," the statement of the location of such pipe as entering the grizzly at the lower end thereof is in the nature of a mere description, and is not a limitation of the claim to that precise construction. (Ross, Circuit Judge, dissenting.)

2. PATENTS — INFRINGEMENT—GOLD DREDGER.

The Postlethwaite patent, No. 622,532, for a gold-dredging apparatus, if conceded validity, is extremely narrow, and its essence is the direct delivery of material from the grizzly with force upon the collecting tables. As so construed, held not infringed.

GENERAL SUBCONSTRUCTION CO. v. NETCHER et al.

(Circuit Court of Appeals, Seventh Circuit. Oct. 5, 1909. 174 F. R. p. 236.)

PATENTS—ANTICIPATION-PROCESS OF MAKING SUBSTRUCTURES OF BUILDINGS.

The Ewen patent, No. 718,441, for a process of making and placing in position substructures for buildings and the like, which consists, instead of making the entire excavation in the first place, "in forming a suitable trench where the exterior wall is to be erected and simultaneously placing in position a lining for said trench from the top downward as the work of forming the trench progresses, then placing braces between the two linings so as to transmit the exterior pressure to the core of earth within such proposed wall, and then erecting within the trench a wall of less thickness than the width of the trench" is for a mechanical process, and, reading the claims in connection with the specificatiou, is not entitled to a construction which would include as a step of such process the use of flexible linings for the trench and their progressive and unequal adjustment by manipulating adjustable and extensible braces to meet inequalities or changing conditions in the adjacent material, and without such construction it was anticipated in the prior art.

GENERAL ELECTRIC CO. v. SANGAMO ELECTRIC CO.

(Circuit Court of Appeals, Seventh Circuit. Oct. 5, 1909. 174 F. R. p. 246.)

1. PATENTS—PROCEEDINGS ON APPLICATION —AMENDMENT OF CLAIMS.

An applicant for a patent, after a successful contest in interference proceedings, can not, withot changing his specification, broaden his claims to include something not shown nor claimed in his original application, but which is claimed in the interfering applicatiou.

2. PATENTS —ANTICIPATION — ELECTRIC METER.

The Cox patent, No. 791,673, for an electric meter, claims, 11, 12, 15, 16, 17, 18, 19, and 20, are void for anticipation.

3. PATENTS—IMPROVEMENTS—"INVENTION"

"Invention," in the nature of improvements, is the double mental act of discerning, in existing machines, processes, or articles, some deficiency, and pointing out the means of overcoming it.

CROWN CORK & SEAL CO. v. STANDARD BREWERY.

SAME v. GREENBERGER.

(Circuit Court, N. D. Illinois, E. D. Dec. 16, 1909. 174 F. R. p. 254.)

1. COURTS -- JURISDICTION OF FEDERAL COURTS—PLEADINGS.

In a suit in equity in a federal court, an allegation of complainant's citizenship in the bill, though denied in the answer, stands admitted, uuless a plea to the jurisdiction is filed.

2. PATENTS — LICENSES — RESTRICTION ON USE OF PATENTED ARTICLE—INFRINGEMENT.

A contract by the user of a patented machine, under which he obtained such machine from the owner of the patent, that it shall be used only in connection with an article made aud sold by such owner, is valid and binding upon such user, even though he buys and pays for the machine and is vested with the legal title thereto, and its use by him in violation of the restriction imposed by such contract is an infriugement of the patent.

3. PATENTS—INFRINGEMENT-CONTRIBUTORY INFRINGEMENT.

The furnishing to the user of a patented machine, under a license binding it to use such machine only with an article purchased from the owner of the patent, of similar articles made in imitation of those of the patentee, and adapted for use and used only on such machines, constitutes contributory infringement.

4. PATENTS—INVENTION—BOTTLE STOPPING DEVICE.

The Painter patent, No. 468,258, for a bottle sealing device, was not anticipated, and covers a patentable combination; also held infringed.

CASEIN CO. of AMERICA v. A. M. COLLINS MFG. CO.

(Circuit Court of Appeals, Third Circuit, Nov. 29, 1909. 174 F. R. p. 341.)

1. PATENTS—PRIOR PUBLIC USE—ENAMELING COMPOUND FOR PAPER.

The Hall patent, No. 626,537, for an enameling compound for sizing paper, and method of producing the same, is void for prior public use of the enamel for more than two years before the application.

2. PATENTS — REISSUE — ENAMELING COMPOUND FOR PAPER.

The Hall reissue patent, No. 11,811 (original No. 609,200), for a waterproofing compound for sizing paper, is void, as broadening the patent to cover an original ingredient of the compound which was disclaimed in the original.

ARMSTRONG v. BELDING BROS. & CO.

(Circuit Court of Appeals, Second Circuit. Nov. 9, 1909. 174 F. R. p. 410.)

1. PATENTS—CONSTRUCTION—ESTOPPEL BY PROCEEDINGS IN PATENT OFFICE.

In interference proceedings between two applicants for patents, one was successful on proof of priority of invention, whereupon his opponent purchased his application and substituted for the claims therein two claims from his own pending application, and the patent was granted thereon. He had previously, through counsel, expressed an opinion as to the meaning of such claims to differentiate them from a prior patent, which, however, was also antedated in invention by the applicant in whose application the claims were later embodied. Held, that such expression of opinion did not estop him from insisting on a broader construction after the patent was issued, which might have been claimed by the original inventor.

2. PATENTS — VALIDITY AND INFRINGEMENT — THREAD PACKAGE.

The Schroeder patent, No. 546,251, for a thread package especially designed for embroidery silk, discloses invention, and is a novel and useful device, and is entitled to a liberal construction; also held infringed.

3. PATENTS—INFRINGEMENT-SKEIN THREAD HOLDER.

The Schroeder patent, No. 546,123, for a skein thread holder, is for an improvement merely, and entitled to a narrow construction only. As so construed, held not infringed.

GRAY TELEPHONE PAY STATION CO. v. BAIRD MFG. CO.

(Circuit Court of Appeals, Seventh Circuit. Oct. 5, 1909. Rehearing denied Nov. 20, 1909. 174 F. R. p. 417.)

1. PATENTS— ANTICIPATION — ACCIDENTAL SIMILARITY OF PARTS.

A patent for a mechanical combination is not anticipated by a prior patent, which incidentally shows a similar arrangement of parts, where such arrangement was not claimed nor designed to perform the function for which it is designed and claimed in the second patent.

2. PATENTS—ANTICIPATION — APPLICATION ANTEDATING ALLEGED ANTICIPATING PATENT.

A patent is not anticipated by other patents, which, although prior in date, had not been granted when application for such patent was filed, and which were therefore not in the prior art.

3. PATENTS—INVENTION AND INFRINGEMENT —TELEPHONE PAY STATION.

The Gray patent, No. 593,720, for a coin-controlled telephone pay station, embodies the first device based upon the idea that the pay-box signal, produced by the falling coin, should be communicated to the transmitter by means of resonant connection between the two, as contrasted with the employment of air waves, as in the prior art. It discloses invention and is not limited to the particular form of connection described, nor was the right to such broad construction lost by anything which occurred in the Patent Office. Also, held infringed.

4. PATENTS — ANTICIPATION — TELEPHONE PAY STATION.

The Gray patent, No. 598,610, for a coin-controlled telephone pay station, discloses no patentable improvement over the device of patent No 593,720 to the same inventor, and is void for anticipation thereby.

SHARP & SMITH v. PHYSICIANS' & SURGEONS' APPLIANCE CO.

(Circuit Court, E. D. Wisconsin. Dec. 15, 1909. 174 F. R. p. 424.)

1. PATENTS — CONSTRUCTION — LIMITATION BY PROCEEDINGS IN PATENT OFFICE.

While an applicant for a patent cannot revive a rejected claim by a broad construction of the claim allowed, the record in the file wrapper is not to be construed too strictly against him, and he is entitled to a fair construction of the terms of the claims as actually granted.

2. PATENTS–INVENTION AND INFRINGEMENT–JOCK-STRAP AND SUSPENSORY.

The Bennett patent, No. 594,673, for a combined jock-strap and suspensory, was not anticipated, and discloses invention, and is not to be so narrowly construed as to limit the patentee to the precise method of construction of the article shown. As so construed, held infringed.

SAFETY CAR HEATING & LIGHTING CO. v. CONSOLIDATED CAR HEATING CO.

(Circuit Court of Appeals, Second Circuit. Nov. 17, 1909. 174 F. R. p. 658.)

1. PATENTS — INVENTION — CAR HEATING APPARATUS.

The Searle patent, No. 707,361, for a railway car heating apparatus, which consists of a system of pipes for the circulation of hot water, the claimed novel feature being the combination of one transfer heater in the riser pipe and another at the lowest point of the circuit, is void for lack of invention in view of the prior art; no new result being accomplished by the use of the two heaters, conceding that they act in combination, and are not merely an aggregation.

2. PATENTS — SUIT FOR INFRINGEMENT — LACHES.

An unexplained delay of 12 years after alleged infringement was commenced before bringing suit constitutes such laches as precludes the recovery of profits or damages.

BILLIKEN CO. v. BAKER & BENNET COMPANY.

(Circuit Court, S. D. New York. Dec. 22, 1909. 174 F. R. p. 829.)

1. TRADE-MARKS AND TRADE-NAMES—UNLAWFUL COMPETITION—ACTION—RIGHT TO SUE.

Where complainant employed the H. Co. to manufacture and sell for it a Billiken doll in the sale of which it was claimed defendant was guilty of unlawful competition, the business of the H Co. was complainant's business, and complainant was therefore the proper party to ask for protection.

2. TRADE-MARKS AND TRADE-NAMES—UNLAWFUL COMPETITION—ACTION—RIGHT TO SUE.

Where the complainant sued for unlawful competition in the sale of Billiken dolls claimed to be manufacturad for the H Co. by a doll and toy company, a royalty being paid by the H. Co. to complainant, the business to be protected was that of the H. Co., and it was therefore the proper party complainant.

3. TRADE-MARKS AND TRADE-NAMES—UNLAWFUL COMPETITION—BILLIKEN DOLL.

Complainant conceived and sold a grotesque doll, made of fluffy, white material, with a large head, wearing a broad, Buddhistic smile, in a sitting positioa. It was sold in a carton, one side of which dropped down when the cover was off, displaying the doll. On the cover was the doll's picture, with a rhyme, signed "Billiken," and on the other side a similar picture and rhyme, etc. Defendant sold a doll of similar design, called "Killiblues," put up in a similar carton. Held sufficient to warrant an inference that defendant's doll was intended to deceive ordinary purchasers intending to buy plaintiff's doll, and hence plaintiff established a case of unlawful competition against the manufacturer, and against sellers of the "Killiblues" doll with the expectation that purchasers would buy them for "Billikens."

4. TRADE-MARKS AND TRADE-NAMES—UNLAWFUL COMPETITION — DAMAGES — PROFITS.

Where, in a suit for unlawful competition in the sale of certain dolls, defendant's claim that it was not the manufacturer of the dolls, but purchased and sold them without knowlege that complainant claimed an exclusive right to place the dolls, packed in a particular carton, on the market, and that the suit was begun without previous notice, after which it immediately began to sell its dolls in plain boxes, defendant was not liable on such facts for damages or profits.

5. TRADE-MARKS AND TRADE-NAMES—UNLAWFUL COMPETITION—INJUNCTION.

Where, in a suit for unlawful competition, it was doubtful whether complainant was the proper party to sue, and defendant claims that immediately on commencement of the suit it stopped selling the article in controversy in competition with complainant's product, a preliminary injunction will be denied.

GENERAL ELECTRIC CO. v. HILLWRIGHT ELECTRIC CO.

(Circuit Court of Appeals, Second Circuit. Dec. 14, 1909. 174 F. R. p. 996.)

1. PATENTS — PATENTABILITY — ELECTRIC BULBS—VACUUM PROCESS.

Howell patent, No 726,293, for an improvement in a process of exhausting air from incandescent electrie lamp bulbs, held not invalid for lack of patentability.

2. PATENTS — INFRINGEMENT — ELECTRIC BULBS—VACUUM PROCESS.

Howell patent, No. 726,293, for process of exhausting air from incaudescent electric light bulbs, held infringed.

3. PATENTS—SIMPLE DEVICE.

The fact that an invention is simple, and that at present it seems to have been obvious to the workers in the art, does not militate against its validity.

4. PATENTS—INFRINGEMENT— TRANSPOSITION OF STEPS.

In a suit for infringement of a patented process, defendant could not avoid infringement by merely transposing the steps of the process.

JOHNS-SRATT CO. v. SACHS CO. et al.

(Circuit Court of Appeals, Secoud Circuit. Dec. 14, 1909. 175 F. R. p. 70.)

1. PATENTS— INFRINGEMENT — CORPORATIONS— STOCKHOLDERS—PERSONAL LIABILITY.

Stockholders of a corporation alleged to have infringed a patent are not liable in the absence of proof of individual acts of infringement.

2. PATENTS—INFRINGEMENT—PRIOR ART.

In a suit for infringement brought by the assignee of the patentee agaiust the patentee and a company he has created and controlled to exploit the same appliance, an inquiry into the prior art to ascertain the validity of the patent assigned will not be undertaken; the pateutee and his corporation being estopped to urge the invalidity of the patent as against his assignee.

3. PATENTS—ELECTRIC SAFETY FUSE-INFRINGEMENT.

The Sachs patent, No. 660,341, for an electric safety fuse, construed, and held infringed.

MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

John W. Cumiskey, Youngstown, Ohio. Concrete Mixing Drum.—This invention relates to a drum employed in mixing concrete and other materials, and its object is to provide means of a simple nature that can be easily constructed, will thoroughly agitate the material, has a comparatively low spilling line and may be made of a comparatively small diameter without deleteriously affecting its capability of thoroughly mixing the ingredients of the batch placed therein.

Matthew J. Dawkins, Riverside, Cal. Two patents.—The first patent relates to a fire-proof building, and has for its main object to provide a structure wherein all combustible materials are eliminated, the building being constructed with sheet metal studs or uprights, each being concave on one side and convex on the other, and so arranged as to effectively engage the cementitious material placed therebetween to form the walls. Where it is desired to provide doors and windows, these same studs will form the window and door casings.

The second patent relates to a railroad track fastening adapted to dispense with the ordinary fish plates, bolts and spikes. The main object of this invention is to provide a metallic device, which will clamp the rails and rail sections of a track securely together. The device is constructed in the form of parallel bars or rods, which will take the place of an ordinary cross tie, and is provided on each end thereof with adjustable clamps adapted to engage the flanges of the rails and hold the same securely in position, and overcoming any tendency of the rails to spread.

Robert L. Breth and Paul M. Campbell, New Washington, Pa. Valve.—The main object of this invention is to provide a valve of reciprocating type, adapted for positively controlling and regulating the flow of water, or other liquid, and capable also of yieldably engaging its valve seat and of being automatically opened by internal pressure, and of automatically closing when the pressure falls below a predetermined amount.

Wallace L. Selleck, Platteville, Wisc. Two patents.—The first patent relates to a barn door hinge designed particularly for use on doors located at the gable end of a barn beneath the projecting eaves, and capable of enabling such door when opened and closed to clear the projecting eaves. The hinge comprises two hinge members having outwardly projecting arms set at an angle to the attaching plates and converging outwardly and pivoted at their outer ends, the arms being of such a length as to permit the door in its opening and closing movements to clear the eaves of a barn.

The second patent relates to a hydrant, and has for its object to provide a casing of such construction which will prevent the hydrant from being lifted out of the ground by the freezing thereof. To this end there is provided a hydrant with two separate valves in alinement, one above the other, the lower valve, which connects directly with the supply source, being adapted to be closed by the pressure of water thereon, and the upper valve, which is operated by the hydrant operating means, being adapted when in a lowered position to contact with the lower valve and open it against the water pressure.

John W. Bell, Dennysville, Me. Design Patent for Article Support.—This patent relates to article supports preferably for holding brush, broom or mop handles, and comprises two plates of the same configuration and adapted to be secured together, having apertures in the center thereof, and integral wall-securing brackets at right angles to said plates and extending along the rear edges thereof. A sheet of resilient material is interposed between the plates, said material having an opening similar to that of the plates, but smaller in size, thus permitting the handle of the article to be inserted through the opening and engaged by the edges thereof.

William S. Hazelton, N. Chicago, Ill. Two patents.—The object of the first patent is to provide a wire fence builder, designed for constructing and building wire fences, and adapted to enable a fence wire to be readily stretched and held while it is being stapled or otherwise secured to a fence post. Another object is to provide a device adapted for drawing the ends of a broken wire together, at a point between the fence posts, and capable of enabling the terminals of the wire, after being overlapped, to be twisted at opposite points to form what is commonly known as a telegraph splice. The device is also capable of drawing staples and of enabling heavy fence wire to be easily cut.

The principal objects of the second patent are to provide a wire fence tool, adapted when repairing broken fence wires, to enable the ends to be readily drawn together, overlapped and twisted at each end of the joint or splice to construct either a loop or a telegraph splice, and having means for twisting or looping the wire to tighten the same, and adapted to enable fastening devices to be driven through the twisted or looped portions of the wire, while the same is held by the device.

Samuel Butz, Easton, Pa. Two patents.—The first patent relates to paving blocks, and has for its main object to provide a block designed for use in paving both sidewalks and streets, and capable of being easily laid and also taken up without injury in either making repairs to the pavement, or in putting down or repairing pipes. A further object is to provide a block, adapted to be constructed either wholly of plastic material, as concrete, or partially of such material, when it is desired to construct a pavement having an upper surface of concrete, wood, or other material, and capable, when a portion of the surface of a pavement is taken up or repaired, of enabling the same to be relaid as good as when first put down.

The object of the second patent is to provide a building block, constructed of cement, or other plastic material provided with air spaces, said block comprising spaced front and rear sections, each provided with vertical air spaces and having their connecting means so arranged as to form connected vertical and horizontal air spaces, arranged independently of the vertical air spaces of the sections, and capable of interrupting the frost and moisture at the joints between the blocks, and preventing dampness and frost from penetrating to the back of the block.

Edward E. Taft, Mt. Pleasant, Iowa. Pipe Hanger. Assignor to Taft Mfg. Co., same place.—The main object of the present invention is to provide a pipe hanger, adapted to be readily applied to a rain spout, a down spout or any other pipe, and capable of offsetting the same from the adjacent wall to prevent dampness and the consequent rusting of the pipe, whereby the life or durability of the rain spout will be materially increased. To this end there is provided a bracket with spaced apertures through which flexible wires or bands extend, the outer ends of which extend around the pipe and are detachably secured together, thus permitting the pipe to be easily removed for repairs or other purposes.

Josiah W. Patty, Lehigh, Okla. Combined Planter and Fertilizer Distributer.—The object of the invention is to improve the construction of combined planters and fertilizer distributers, and particularly to provide a means for driving both the seed hopper and fertilizer distributer intermittently, whereby in planting corn in hills, fertilizer will be deposited in each hill, or the same driving means may be shifted for driving the seed hopper and fertilizer distributer continuously, as in planting cotton seed.

Kenneth W. Daughdrill, Oneonta, Ala. Wheel Locking Apparatus for Tram Cars.—The main object of this invention is to provide a device for locking the wheels of tram cars, and one which will enable the wheels of the car to be automatically locked when the car stops, and capable of automatically releasing the wheels of the locking devices when it is desired to start the car. To this end the locking attachment is connected with, and automatically controlled by, the draft mechanism so as to lock the wheels when the draft mechanism is slackened, and to relieve the wheels of the locking devices when the draft mechanism is subject to strain, whereby the wheel locking devices of the entire train of cars are automatically operated by the starting and stopping of the actuating means.

Ramey Kirkwood, Covington, La. Gem Setter.—The inventor's aim is to provide a gem setting device, adapted to clamp and securely hold gems of different forms and sizes in settings, while the prongs thereof are bent into engagement with the facets of a gem. The device is in the form of a hollow reversible mandrel provided with a plurality of flat faces having setting receiving seats therein, and also provided with slots connecting the seats, the settings being held by this mandrel and the gems being adapted to be held on said settings by a depending screw threaded rod carried above said mandrel.

Eliah F. Kirksey, and John F. Stegall, Clarksville, Texas. Tool Sharpener. — The object of this invention is to provide a device for sharpening various instruments, such as plows, disks, tools, etc,, and capable of operating on the same either in a hot or cold condition. The invention comprises a pair of cone-shaped grinding wheels positioned one above the other in a supporting frame, and having intermeshing gears on the rear portions of the grinding wheels, a gear wheel mounted on a shaft carried by the frame and intermeshing with one of the gears for imparting motion to the same, and a guard positioned between the grinding wheels and gear wheels for preventing the tools from contacting with the gear wheels.

John T. Anderson, Urbana, Ohio. Hand Cultivator. –This invention provides an improved construction in hand cultivators, and one which is easily handled, capable of affording the operator great power in pushing it, and equipped with blades or shovels capable of simultaneous or independent lateral adjustment to arrange them the desired distance apart, and adapted to be quickly changed from one adjustment to another.

Edward C. Brown, Bismarck, North Dakota. Device for Hanging Storm Windows or the like.—The object of this inventor is to provide a device which will enable one man to hang storm windows, screens or the like, without the danger of the window or screen falling on some one below, or the operator being compelled to get on the outer edge of the window during the hanging operation. The device comprises an adjustable transverse clamp adapted to fit across the window and engage the casing thereof at each side, a clamp adapted to engage the central cross bar of the storm window, and a flexible cord connecting the two and extending through suitable pulleys, thus permitting a ready adjustment of the storm sash or screen at all times.

Fred R. Slockett, Fort Collins, Colo. Rail Clamp.—The novelty of this invention consists in providing a metallic cross tie, substantially U-shaped in cross section, equipped with rail-engaging means in the form of plates clamped to the sides of the tie and provided with jaws which are reversely arranged to engage the bottom flanges of the rails at the inner and outer sides thereof, thus providing a means for securely holding the rails and effectually preventing the same from spreading at curves and other places and dispensing with the use of rail chairs, tie bars and the like.

Glen I. Willett, Ree Heights, S. D. Two patents.—The first invention relates to a post hole auger, and it consists in a metallic post hole auger, equipped with a plurality of straight longitudinally disposed equi-distant flat blades, extending outwardly and radially from a common center and connected together at the longitudinal axis of the auger, and having tapered lower portions to form a tapered or pointed lower end for the auger, said blades being also provided on their outer edges with a cutting edge, which construction will permit the auger to operate in the hardest ground.

The second patent has for its main object to provide a lock adapted to be used on mail pouches, the shackle of the lock being permanently attached to the pouch and when locked encircling the same tightly, and said shackle having flanges or other means for securing a destination tag, thus dispensing with the old method of tagging mail pouches.

James Markey, Wollaston, Mass. Ash Sifter. Assignor of one-half interest to Meyer Winer, Quincy, Mass. —The inventor's object in this patent is to provide a metallic air tight ash receiver in the form of a circular casing, adapted to fit over the ordinary ash can, and provided in its interior with parallel tracks, adapted to support a reciprocating hollow bottom sieve carrier, which receives a wire sifter basket, in which the ashes to be sifted are placed, thus affording an easy means when the coals are sifted to quickly remove them from the sifter.

William J. Thomas, Inglewood, Cal. Adjustable Holdback.—This invention is an improvement upon a prior patent granted in 1905. The main object of this invention is to provide an adjustable holdback, which facilitates a rapid, accurate and instantaneous adjustment of the holdback straps and adapted in the event of breakage of the singletree, or a similar accident, to automatically disconnect the holdback straps from the thills. The invention also facilitates unhitching by enabling the animal, after the traces have been unhitched, to step from the vehicle without dragging the same after it.

NEW PATENTS FOR SALE.

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FOR SALE—Patented wire guide for paper-making machines. Patent No. 906,877. Address, 1050 East Eighth St., Erie, Pa. jan

FOR SALE—U. S. Patent No. 961,290, dated June 14, 1910. Replanting attachment for cultivators. A hoon to all corn growers. Will sell outright. If interested, address, William Faust, Higgins, Texas. jan

FOR SALE—Patent No. 960,942, dated June 7, 1910. Automatic Pump. Will sell outright at a reasonable price. Address, Samuel J. Jackson, Pleasanton, Alameda County, Cal. jan

FOR SALE—Patent No. 962,161, dated June 21, 1910. Gas burner for furnaces. Uses one-fourth less gas than other burners; will not flash out in your face when furnace door is opened. Will sell outright or on royalty. Address, Thomas Mowcomber, Elkland, Pa. jan

FOR SALE—Patent No. 963,417, on royalty or outright. Device for Hanging Storm Windows and Screens. The only invention of its kind. Can he manufactured at small cost. Address, Edward C. Brown, Bismarck, North Dakota. apr

FOR SALE — U. S. Patent No. 958,672, and Canadian Patent 126,790, on Self-Waiting Tables. Address, Karl J. Olson, P. O. B. 392, Gladstone, Michigan. dec

FOR SALE—Patent No. 957,561, dated May 10, 1910. Quilting Frame. Something every family needs. The handiest frame ever made. Will give a good commission if sold soon. If interested write me. Fred Jakoh, Bartley, Nebr.

FOR SALE — U. S. Patent No. 947,865, and Canadian Patent No. 127,371, on a Door Catch. Either outright or on royalty. Address, William D. Tauhert, care Alfred Nuffer, Hills, Minn. dec

FOR SALE—Patent No. 959,481, dated May 31, 1910. Automatic Rivet on Scissors. Cuts clean, saves worry and time for women. Part cash and royalty. Address, John W. Dowden, Box 122, Reeves, La. dec

FOR SALE—Patent No. 931,287. Permutation, Keyless Lock. May he used on trunks or suit cases; cannot be picked; no danger of losing key; profitable invention if properly handled. No reasonable offer refused. Address, Wm. Erhardt, 112 Munson Street, Astoria, Long Island, New York. dec

FOR SALE — U. S. Patent No. 939,727 and Canadian Patent No. 155,875. Snap Hook. Automatic adjustment and easy operation; capable of various uses and is self-locking. Will sell outright, or for any state or county. Address, Matti Maki, Grelland, North Dakota. dec

FOR SALE or on royalty—U. S. Patent No. 961,174, dated June 14, 1910. Micro-adjustable foot-arch support. Worn in insole. For weakened or flat feet. Wearer can raise or lower by turning a screw. Supports either inner or outer arch of foot as comfort suggests. Result of eight years professional study and experimentation. Splendid article for growing mail order business. A. M. Smith, D. O., Hagerstown, Md. dec

FOR SALE or on royalty—U. S. Patent No. 962,048. Potato Grader. Will sort potatoes into three different sizes free from dirt. Great labor-saving invention for either farmer or dealer. Address, Hans Peterson, Mora, Minn. dec

FOR SALE—U. S. Patent 952,792. dated March 22, 1910. Combination straight edge shingling and clapboard gage. Address, C. H. Webster, Thomaston, Maine. dec

FOR SALE—Patent No. 958,461, for quick detachable wagon skates. Sets made to sell for ten dollars with big profits. Absolute necessity. Make a sleigh of any wagon in ten minutes. For particulars write, Max Aubertel, Cornwall-on-Hudson, N. Y. dec

FOR SALE—U. S. Patent No. 957,308. issued May 10, 1910. Wagon-jack. Can be manufactured at small cost. I wish to sell outright for cash. For particulars write, M. G. Colby, Main St. Sta., Franklin, N. H. dec

FOR SALE—Patent No. 958,915, dated May 24, 1910. Hopper closet grappling hook for plumhers' use. For removing stoppage to hopper closets, sewer traps, etc. Easily manufactured; quick sales. Address, E. C. Fraw, Jefferson, Ohio. dec

FOR SALE—U. S. and Canadian patents Nos. 948,849 and 126,016, respectively, dated Feh. 8, 1910 and May 31, 1910. A practical jamh adjuster. Just the thing for contractors and carpenters. Outright sale or on royalty. Greatest time saver. Address, Christian Ehr. Portage, Wisconsin. dec

FOR SALE—Patent No. 910,785, dated Jan. 26, 1909. The ultimate universal detachable sanitary soap dish. Holds soap firmly when throwing water out. A hoon to all homes, camping and outing parties. Can be manufactured at small cost. Apply to T. C. Colton, Griswold, Man., Canada. dec

FOR SALE on royalty—U. S. Patent No 949,694. Brush Cleaner for Carpet Sweepers. Address, Armor & Collner, St. Petersburg, Pa. dec

FOR SALE — Patent No. 900,737, dated Oct. 13, 1908. Novel and practicable hank for use on douhle and single stays of the largest ships or smallest yachts. Address patentee and owner. Samuel A. Jackson, Box 26, Kittery, Maine. dec

FOR SALE or royalty—Patent No. 955,210, an attachment that converts any walking turning plow into the best sulky plow made. Can he manufactured cheap and sells at a big profit. Address, L. H. Ruch, R. D. No. 3, Winchester, Tenn. dec

FOR SALE—U. S. Patent No. 958,546, issued May 10, 1910. Railway Spike. Impossible to work loose of itself. Impossible for rails to spread. Any reasonable offer considered. Address, R. A. Rossmeisl, Whitingham, Vermont. dec

FOR SALE or exchange for real estate—U. S. Patent No. 950,630, dated March 1, 1910; Canadian Patent June 6, 1910. Trolley Poles. Can't come off wire. Very good invention. For particulars and price address, Henry Brod, St. Charles, Mo. dec

FOR SALE—Patent No. 959,309. Car Fender. Can he manufactured cheaply. Will sell outright or on a royalty basis. Cheap for quick sale. Address, A. H. Carter, 2235 Cutter Ave., Canton, Ohio. dec

FOR SALE — Patent No. 956,542, dated May 3, 1910. Peterson's Automatic Damper Control, Simple, durable, reliable and practical. Something needed in every home, store, factory and public building. Will sell outright, or will consider a reasonable royalty proposition. Address, Hjalmar Peterson, Falun, Wisconsin. dec

WANTED.

WANTED—Read the latest and hest hooks of all kinds at low cost through our renting system. Address, C. C. Lutes, Noxen, Pa. dec

WANTED—A company to manufacture a bag holder made of sheet iron. U. S. Patent No. 968,349. dated August 23, 1910. Will have patent for Canada in a short time. Address, Louis Hanson, Cottonwood, Idaho. jan

WANTED—Twenty per cent interest in one of the hest inventions for financial assistance; $250 to be used for protecting invention, making models, etc. For further particulars address, W. M. Ramershofen, 1410 Hyde Street, San Francisco, Cal. dec

WANTED—To sell interest in patent office and library specialty recently placed on the market. Purchasers duplicating orders both in U. S. and foreign countries. For full particulars address. Oscar Dreher, No. 213 Wallace St., Stroudsburg, Pa. dec

WANTED—Help to organize and promote a company to establish small mills in timher sections to manufacture material for my patented Veneer Barrels. Have an export and domestic trade using 800,000 harrels annually. Address, George H. Brown, 295 Duke St. Norfolk, Va. jan

The Inventive Age

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The Value of Patents.

We are frequently asked to fix tbe value of a certain patent, as if there were some standard by which the value of a patent could be gauged. There is no such standard. In the case of real estate, the value of property is determined by the price paid for adjoining land. Appraisers can in this way, as a rule, arrive at a fair valuation. In the case of patents, however, it is impossible to decide tbe value of one by comparing it witb another, even of the same class. A patent may be issued in 1910 for a toy, and the owner may realize several thousand dollars on it. Another toy of the same date may have apparently equal merit, and yet the patentee gets nothing. Not even an expert, examining the two devices before they were put on the market, could have decided the respective values. The question is almost wholly one of supply and demand and individual merit. The price that one patent may bring is no criterion by which tbe wortb of another may be judged. As we have often said, a patent is worth as much as the owner can get for it. This does not mean, by any means, tbat a man who has received a good offer sbould hold out obstinately for more, on the assumption tbat if he is offered two thousand dollars, he may get five tbousand dollars. We have known of instances where capitalists would have paid two thousand dollars for a device, and would not have invested more. Many sales have been lost because the inventor was determined to get a higher price.

Inventors are too often misled by the advertisements of a certain class of patent solicitors, who seek to create the impression that there is a demand for devices; by sending out circulars containing "lists of inventions wanted," and filling the columns of newspapers with declarations that a million dollars will be paid for a certain apparatus, and a hundred thousand for another.

As soon as a patent is issued, the patentee receives a bushel of circulars from patent sale agents, urging him to let them handle his patent. They are sure they can dispose of it, and for a small commission. It is noticeable that this commission is payable in advance, or there are certain inevitable preliminary expenses for examining the patent, etc. The inventor, who is not familiar with this particular kind of fraud, feels that his patent is very much in demand. His original impression as to its value is confirmed by this mass of flattering correspondence, which further contains accounts of the high prices received for some machines, and the fortunes made by the owners. It is not strange that a patent that might be sold for a few hundred or a thousand dollars, and that would at this rate return a good profit on the time and labor devoted to it, remains unsold, because the patentee feels that it sbould bring him from twenty-five to a hundred thousand dollars. Between the misleading advertisements of patent attorneys, and the circulars of swindling sale agents, it is no wonder that tbe inventor makes an inflated estimate of the worth of his patent. We will say frankly that many patents are not worth tbe money expended in procuring them, and if the holder can recoup himself to this extent, he will be doing well. We do not mean to convey the impression tbat there is no money in patents, for tbere is. When a device has been produced that fills a public want; when it is an improvement in a commercial sense and can be inexpensively manufactured; when the patent is well drawn and covers it fully, and the public does not bave to be educated to the use of it—as often happens—the patent on that device possesses merit, and is valuable. But even in this case. it is impossible to state just what the value would be. The selling price must be taken into consideration, the probable annual sales, the cost of placing it on the market, whether through traveling salesmen or by advertising, or both; and, in view of the above cited conditions, the profit on each article. We recall an instance of an inventor who had formed a company to exploit his new machine. He was confidently figuring on 150 per cent profit, but it transpired that he had not included the cost of selling, estimating only on the cost of manufacture and the selling price. In the end, the expense of advertising, hiring salesmen and sales rooms, etc. amounted to double the cost of merely making the article.

It is unfortunate that an inventor sbould be influenced as we have above described, and that there are no counteracting influences to enable him to learn the truth about this question of patent value. It is of course more profitable for the gentlemen engaged in the enterprises described, to advertise "patent your ideas, there is money in them," than to follow legitimate lines of trade. As a matter of fact, no idea is, strictly speaking, patentable. It is the embodiment of the idea, and not the idea itself, that can be protected. We hope that in time patentees will come to a safe and conservative estimate of the value of their property. They will find it to their own interest to do so.

Selling Patents by Auction.

All sorts of schemes have been devised for selling patents—or for at least making a pretense of selling them; but it has remained for a Washington concern to propose a plan which, although specious and attractive to the uninformed, is actually one of the most bare-faced attempts to fool the inventor that has ever been brought to our knowledge. A flood of circulars have been recently sent out to patentees all over the country, referring to a "Public Auction of United States Patents," and calling on owners of patents to enter tbem on the list, so that they may be sold. The fee for this listing, it should be remarked, is $1. This seems an insignificant sum, especially when it is advertised that there are no extras, and the amount specified covers all charges until the patent is sold. We have no doubt that many inventors have been tempted to send the dollar, reasoning that they could afford to risk that much, on the chance of selling a patent of whose merits tbey are convinced, and which, they believe, only needs to be brought to public attention to become generally appreciated. An auction, too, seems a good method of advertising the device, even if it is not sold at the figure whicb the inventor specifies as the lowest price that he will accept. When it is remembered tbat over 500 patents are issued every week, and that the majority of them remain unsold, it will be realized that the enterprising concern managing this scheme has probably received a good many dollars from individual patentees. It costs a small amount to have the circulars printed, two cents apiece to send them out by mail, and five cents to buy the copy of the patent. Even allowing for a large proportion of correspondents who do not reply to this seductive offer, the margin of profit is seen to be large. The concern, which calls itself a patent exchange, has doubtless reaped a rich harvest of dollar bills.

The announcements of this scheme declare that "This is the most widely advertised and most largely attended patent auction in the United States." This is a perfectly safe assertion. It is the *only* auction of the sort. No one has ever before, to our knowledge, attempted to carry through a scheme of this particular sort. Of all classes of property, patents are the least adapted to be sold in this way. Auctions of horses are notoriously risky, but the chances of deception are infinitely greater in an auction of patents. Three card monte games and gold brick enterprises are legitimate commercial transactions in comparison. Can any one imagine a capitalist or a business man with money to invest, buying a patent in this way? To look at the patent document may give some idea of the device, but it affords no conception of the scope and validity of the patent itself. Any one who wishes to buy a patent demands first to be shown the merits of the invention. Investigation is then made of the prospective demand for the same on the market. The breadth of the claims are carefully examined, and searches made to find out if the patent really covers the apparatus, as it appears on the surface to do. When all these questions have been satisfactorily answered, and not before, an offer is made for the patent. To buy it merely on the face of the papers would be like investing money in a lottery ticket.

Much of the money that will be sent by inventors in response to this advertisement will represent hard earned wages. That is the pity of it. We have no hesitation in advising our readers that the "patent exchange" will not sell a single patent. There may be a few "blind" sales, to create an impression of sincerity, but most of the business will be transacted in this way: The auctioneer will hold up a copy of a patent, on a nutlock, let us say, before tbe curiosity seekers assembled in the room, and say: "Here is a patent on a nutlock. What am I offered for it?" Silence reigns. No offer is made. The auctioneer, unabashed, lays down the patent, picks up another, and goes tbrough the same rigamarole. The inventor is notified tbat the auction has been held, his listed patent has been offered, and the dollar has been earned. The exchange regrets that no offers within the price specified by the patentee were obtained at this sale, but there will be another in a few weeks, and there is reason to believe it will be attended by a more fortunate outcome, if the patentee will remit another dollar for listing again. It will be seen that the plan is capable of almost indefinite extension.

Washington is the last place in the country in which to sell patents. This is partly due to the fact that the Patent Office is located here, which facilitates the investigation of patent claims. The residents moreover are of a conservative class, and there is no manufacturing, which makes it practically impossible for new enterprises to gain a foothold. The promotors of the "patent exchange" know these truths as well as anyone; but what they want is to get in touch with inventors, and by pretending to sell patents, to build up a private business of their own.

Tbe "auction" is regarded as a joke in Washington. On the auction day the room of the "Patent Exchange" partakes of some of the features of a free lunch counter, sandwiches and spirituous liquors being dispensed to refresh the few present. It is hinted that the proprietor of a local wine room is interested in the enterprise, and the presence of bottles bearing his name lends color to the suggestion. Whether this is true or not, it is impossible to learn who is back of the enterprise. The secretiveness of the manager in this and other matters connected with the Patent Exchange is singularly out of harmony with the necessity for publicity which is present in every legitimate auction sale.

The fact that they go through the form of an auction makes it difficult to crush the scbeme by recourse to law,

by cutting it off from the mails, and we fear it will flourish and prosper before patentees generally awake to the knowledge that they are being buncoed.

Bacteria in Art.

At a recent German exhibition a remarkable piece of work was shown in the shape of a well-executed landscape composed of colonies of different colored bacteria thriving in gelatin and meat extract. The exhibition was one of eccentric art, where there were also displayed artistic compositions in spinach and egg, and combinations of spices in different colors; but the moving pictures presented by the bacteria attracted the most interest.

Mechanical Bees.

The busy bee has been so overworked of late that he has not had time to do all his duty, and machinery has been devised to assist him. The latest novelty is a device for cross pollenizing clover, and it consists of a platform, the under side of which is covered with a myriad of minute fibrous fingers arranged like the bristles of a brush. The end of each fiber is covered with a rubber-like substance to which the pollen of the clover will cling. When driven across a field, the platform, or frame, moves up and down, and the little fingers reach down into the heads of the clover. All the operator of the machine needs to know is when the pollen is in the proper state to be carried from one blossom to another by the machine. Clover pollen, unlike that of most plants, is heavy and has a tendency to adhere to the heart of the blossom. The period in which the pollen can be carried from one blossom to another lasts not longer than two or three weeks. Consequently, it would take a vast army of bumblebees to carry the pollen from every head of clover to some other head, even in a small field. The pollen cannot be carried by the wind, and bumblebees are diminishing in number and have too much to do, and therefore a mechanical bee is a necessity.

Fluorin.

The element fluorin is the fury of the chemical world, although, strangely enough, it exists peacefully in company with calcium in fluorspar and also in a few other compounds. Although this element was known and named a good while ago, it long resisted the efforts of chemists to isolate it—that is, prepare it in a pure state, unmixed chemically with other substances—for the instant the compound containing it was torn apart, the free fluorin attacked and combined with whatever substance composed the vessel containing it. It was finally isolated by the great French chemist Moissan.

Fluorin is a rabid gas that nothing can resist. It combines with all metals, explosively with some; or if they are already combined with some other non-metallic element, it mercilessly tears them away from it and takes them to itself. In uniting with sodium, potassium, calcium, magnesium and aluminum, the metals become heated even to redness by the fervor of its embrace. Iron filings slightly warm burst into brilliant scintillations when exposed to it. Manganese does the same. Even the noble metals, which at melting heat proudly resist the fascinations of oxygen, succumb to this chemical siren at moderate temperatures.

Glass is devoured at once, and water ceases to be water by contact with this gas, which, combined with its hydrogen, at the same moment forms the acrid, glass-dissolving hydrofluoric acid, and liberates ozone. Even hydrofluoric acid eats into and destroys every known substance except platinum and lead.

Culture of the Coca Plant.

The demand for cocaine is so great and increasing so steadily that the plant from which it is derived is now being grown commercially. In various countries of South America, and especially in Peru, whole farms are devoted to this culture. Coca plants are propagated from seed in nurseries, and set out later in the fields. They begin to yield regular crops at the age of 18 months and continue to be productive for half a century. The ripe leaves are carefully picked by hand, like tea leaves, dried in the sun, and packed in bags. Most of the crop is sent to Germany, where cocaine—the alkaloid obtained from the leaves—is extracted therefrom. It is put up for sale in the form of crystals, which are white and look like sugar. It is frequently employed as a local anaesthetic. With the cheapening incident to its commercial production, it can be bought for one-twentieth its former price. One of the unfortunate results is that it is in ready reach of drug habitues.

Pneumatic Tube Transmission.

The most rapid method of transmitting parcels known to the world today is probably the pneumatic tube device generally employed to distribute packages in the big department stores. The manner of operation is very simple. A strong draft of air is caused to flow through a tube of approximately even diameter, which sucks after it a small car made to fit neatly into the tube. So speedy has this mode of transportation proved, that an experiment was recently made in Illinois with a life-sized vacuum tube for the conveyance of large bundles and even persons.

A tube of concrete one-half mile long and about six feet in diameter was constructed, and a powerful fan placed at one terminal. A small car was run in at the other. This car, carrying a load of large bundles and a few men, ran through the air-tight tunnelway at the rate of about two miles per hour, proving the device to be so practical that a full trial is to be given a similar gigantic tubular system below the streets of Cincinnati, Ohio. It is believed that if this latter proposed system proves a success, such tubes will be run between the different important isolated cities of this country. The postoffice department has been investigating this tube with a view to making use of a similar one for the transportation of the mails. It has tried the smaller tube on former occasions, but found it impracticable.

Machine Made Glass.

Until within recent years, sheet glass had its origin in the blower's breath. Then a window glass blowing machine was invented, and hailed as an industrial marvel. And now an apparatus has been devised to make glass without blowing it at all—turn it out in a continuous sheet, and enable one man or two boys to efficiently perform the work of 13 skilled mechanics. Up to this time practically all the world's window glass has been made by the cylinder process. The blower would dip the end of a blow tube five or six feet long into the molten metal, and by twisting it, a lump of 20 pounds or so would be gathered on the end. This he would blow into a pear shape, and then it would be rolled on a smooth iron slab. The workman would reheat the cylindrical mass and swing it from side to side over his head, reheating as often as necessary, until it was drawn out into a true cylinder, four or five feet long, with a diameter of twelve or fifteen inches, one end being closed and the other having the blow pipe attached to it. The cylinder would then be again heated in the furnace, and the cool end of the blow pipe closed with the finger. The heat expanding the air within the closed cylinder hurst the heated end, which was then reduced with an iron tool to the diameter of the rest of the cylinder. By throwing a thread of hot glass around the shoulder of the cylinder, and making a crack by applying a cold iron, the cylinder was easily detached from the blow pipe. It was then scratched inside with a diamond and placed in a flattening kiln, being opened out when soft with wooden tools along the line which had been scored with the diamond. Under the influence of the heat the glass flattened out on the smooth floor of the kiln. The output of this kind of glass was necessarily restricted to the number and working capacity of the human blowers. But now a machine has been devised that will draw sheet glass of any reasonable width and of any desired thickness, surface and polish, without the aid of gatherers, blowers, etc. In this apparatus, the mixture from which the glass is made is drawn into a melting tank of a capacity of 110 tons, 12 tons being melted every 24 hours. From the tank the molten glass flows into what is known as the "dog-house," where it is refined and passes into the working chamber. And now comes the most interesting process—the way in which the inventor has overcome the great obstacle of controlling the width of the sheet as it is drawn out. Glass, like all sticky and semi-fluid substances, will shrink and draw to a thread as pulled. Spheres of fire clay, carried on the end of long arms, are plunged into the molten mass and revolve upward and away from the edge of the sheet. This imparts an outward motion to that portion of the molten mass lying adjacent to the edges of the sheet, thereby offsetting that tendency to narrow down to a thread which was the supreme obstacle to an efficient machine.

By this means, sheet glass of any desired width and thickness can be drawn continuously at a speed of 48 inches a minute, compared with 12 inches by the cylinder blowing machine. The surface has a beautiful mirror-like finish, equal to that of the best plate glass. But at first, wave like lines were formed on the surface, and dust particles dropping into the working chamber caused trouble. This was overcome by placing near each side of the sheet, a rotating fire clay cylinder, slightly immersed in the molten mass, remote portions of the glass being under heat. These rollers rotate in opposite directions while the sheet of glass is being drawn, making but one revolution in from 10 to 30 minutes, and serving perfectly to equalize the temperature of the molten glass in the working chamber—a highly necessary factor in drawing an even thickness. The molten glass adjacent to the edges just beneath the surface moves outwardly from the central line of the sheet, thus being held to its full width. As the sheet moves upwardly, there is drawn upon it some of the portion of the molten glass just beneath the surface. The skin or surface portion of the glass in the working chamber adjacent to the side of the glass being drawn, becomes the skin or surface of the finished drawn sheet. Simultaneously, the two rolls on opposite sides of the sheet of glass skim some of the surface of the molten glass lying between the rolls and the sheet of glass, away from the sheet. The result of the combined action of the drawing of the sheet and the moving of the rolls, is a constant skimming of the molten glass lying between the two rolls, so that a fresh portion or a new surface is constantly being exposed to the cooling effect of the atmosphere, which has not time to form wave lines on its surface before it is passed into the drawn sheet, or over the revolving rolls. The sheet travels upward from the melting pit for about five feet and then passes to carrying and cutting tables. It is a wonderful sight to see a continuous sheet of glass, 100 feet long, the end of which is cut off, sheet by sheet, in lengths of about six feet as it emerges upon the cutting table.

Swimming Machinery.

An ingenious apparatus designed to support persons unskilled in swimming has been recently tested in the river Seine near Paris by a French engineer. It comprises an air filled cushion fixed on the back of a person, which, by supplying the desirable floating capacity, prevents him from sinking. Fastened to the chest by means of leather straps is a shield, fitted in front of the head for protecting the nose and mouth against the impact of the waves. This, as well as another shield likewise fastened to the chest, carries the propelling device proper, consisting of a small screw which moves to and fro on the worm shaft. The propeller is actuated by a hand-driven lever system. Both hands seize the end of a long lever arm to produce the reciprocating motion, resulting in the rotation of the propeller on its worm shaft. The invention is useful for sport as well as for life saving.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy.—Please give correct data in ordering.—Address,

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

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Metallic substance, Pyrophoric...A. Huber
Microtelephone.....J. N. Wallace
Milking-machine, Vacuum automatic.....F. B. Groff
Minerals, Separating.....A. S. Ramage
Mixer and sprinkler, Combined.....Z. G. Sholes
Mold.....J. Rodham
Molds, Drying.....J. C. Davis
Mop-wringer attachment for pails.....M. Charpentier
Mortar-mixers, Blade or paddle for.....J. Laun
Motor control, Electric.....L. V. Lewis
Motor control system, Alternating-direct-current..2 pats.....R. P. Jackson
Motor-controlling apparatus..S. H. Keefer
Motor-engine turbine or reaction wheel, Internal-combustion.....J. Hutchings
Motor for driving boiler-tube cleaners.....H. F. Weinland
Music-records, Apparatus for producing.....J. J. Walker
Musical-instrument finger-board.....K. I. Finney
Musical instrument, Percussion.....H. E. Winterhoff
Nail clipper and file, Combined.....H. D. Bader
Nailing-strip.....J. F. Leslie
Necktie.....H. T. Loomis
Necktie-holder.....C. Kern et al
Net-lifting device.....J. W. Atwood
Nut-lock.....J. K. Greer
Nut-locking device.....C. W. Levalley
Oil-burner.....C. D. Wright
Oil-burner.....G. F. Moody
Oil-press.....L. W. Cursey
Oiling device, Automatic....J. M. Hopwood
Orchard-heating device.....F. Stapp
Ores, Reducing.....F. M. Becket
Oscillating motor.....L. S. Rizer
Outlet-box.....N. Marshall
Overhead switch.....J. C. Fitzgerald
Packing.....H. W. Rambery
Packing.....J. C. Kingsbury
Pad.....W. H. Fox
Padlock, Combination.....W. Trierweiler
Paint and varnish, Antifonling..2 pats.....W. Schoeller et al
Paper-making or like machine.....G. Brennwald
Parcel-handle.....O. Leuschner
Pavement-blocking device.....R. S. Blome et al
Pen, Drawing or ruling.....A. S. Robinson
Penholders and the like, Combined finger-guide for.....H. J. Montgomery
Pencil-sharpener.....N. Stafford
Percolator, Coffee and tea.....G. Mueller
Photographic apparatus.....A. A. Brooks
Photographic emulsion (Reissue).....Y. Schwartz
Piano, Player grand.....W. F. Cooper
Pile-protecting.....J. Rowe et al
Pipe and making the same.....J. B. Law
Pipe-dredge.....T. J. Lovett
Pipe-joint.....W. Christy
Pitchfork, Pressed-sheet-metal....I. Szalai
Pivot-light..3 pats.....A. H. Lent
Pivot-light..2 pats.....P. B. Donahoo
Planter, Corn.....J. N. Stout
Planter, Hand.....J. L. Gwaltney
Planter-shoe.....S. A. Pogue
Pneumatic motor.....E. T. Turney
Pneumatic operating devices, Electrically-operated control mechanism for.....H. Rountree
Pocket, Saleswoman's.....G. Baker
Polishing compound.....E. M. and C. C. Hughes
Post or column of metal, cement, &c.....J. T. G. Hand
Potato-digger..2 pats.....J. Reuther
Power-transmission device.....G. S. Welsh et al
Precipitation apparatus.....T. Edwards
Pressure-regulating apparatus..T. G. Mouat
Print and process, Sensitive safety.....H. W. F. Lorenz
Print and process, Sensitive safety litho..H. W. F. Lorenz
Printing-form.....H. J. Smith
Pulley-block.....H. L. Williams et al
Pump.....E. W. Clark
Pump, Automatic air.....J. A. Kenworthy
Pump, Rotary.....B. Lobee
Pump, Steam-engine air.....T. Thompson
Pump, Syrup.....T. H. Schutt
Punch, Hand perforating..C. H. Reeve et al
Putty trowel.....S. F. Wright
Rail-joint.....S. Lee
Rail-joint.....H. L. Moyer
Rail-joint.....J. Senior et al
Rail-joint.....W. P. and S. G. Thomson
Rail-supporter.....R. C. Smith
Railway-crossing.....J. H. Eymon
Railway-rail.....S. H. McCarty et al
Railway-rail fish-plate chair....F. W. Pool
Railway switch and frog..A. M. Threewits
Railway-switch signal.....F. L. Tapia
Railway-switches, Means for operating detector-bars for.....H. Gust
Railway-tie.....M. J. Dowling
Railway-tie fastening.....A. R. Young
Railway-tie, Metallic.....S. B. Stuart et al
Rate and quotation sheet....B. E. Allison
Razor, Safety.....G. W. Conrow
Razor, Safety.....A. A. Pratt
Recessing-machine.....O. M. Mowat
Reclining-chair.....G. W. Piche
Recorder.....W. S. Brown et al
Register.....H. McCormick
Regulator.....L. R. Smith
Reinforcing-bar.....A. L. Johnson
Relay.....D. J. McCarthy
Relay for block-signal systems.....L. A. Hawkins
Relishing-machine.....J. H. Burke
Rivet-making means.....D. G. Clark
Rock-drill, Fluid-operated...C. B. Richards
Roller and the like handle, Lawn.....W. J. Dunham
Rolling in recesses in blanks.....J. Heller
Rolling-mill-operating means.....B. Wiley
Roofs and the like, Covering for.....J. H. Munro
Rope-machine.....R. A. Davis
Rotary engine, Reversible.....C. Lecaime
Rowlock.....E. T. Lindsey et al
Rubber goods, Manufacture and repair of India.....T. Gare
Ruler, Parallel.....W. A. Porter
Saddle, Shield-carrying.....H. S. Baker
Safety-tube and pop-off valve.....W. H. McNutt
Sanding-machine.....Z. P. Charpentier
Sap-gatheriug tank.....J. and H. Clark
Sash holder, Window.....F. E. Erickson
Saw, Bone.....A. Meyer
Saw-filing device.....J. S. Gwynne
Scale.....J. Hopkinson
Scale, Spring.....M. H. Hansen
Scissors.....A. B. Ramsey
Scoop or dipper, Excavating.....C. L. McKenzie
Scraper, Drag.....K. K. Braddock
Screen.....J. R. Fogg
Scriber, Follow-board.....W. H. Sechler
Scrubbing-machine.....A. C. Andrews
Sealing machine, Bottle.....P. Conrad
Separator feed device, Centrifugal.....C. H. Hackett et al
Serving-table and towel-rack, Combined...W. F. Bernstein
Sewing-machine.....M. H. Stubblefield
Sewing-machine, Overseam.....A. A. Merritt et al
Shade-hanger.....A. H. Sammons et al
Shade-holder.....A. S. Lyhne
Shade-holder.....E. T. Stoddard
Shade-holders to sockets, Device for attaching.....A. S. Lyhne
Shaft winch attachment, Stationary-hoister.....A. Lambert
Shafts, Means for fastening rolls to.....C. D. Curry et al
Sharpening machine, Skate.....H. Roberts
Shelf-support.....D. E. Hunter
Shirt.....R. C. Goff
Shock-absorber.....C. Wilson
Shoe.....J. N. Schwander
Shoe-form.....W. S. Lougee
Shoe-shining chair.....J. Silverman
Shovel.....H. J. Tiedt
Shovel and like tool handle.....C. Jones
Siding-strip.....R. B. McFarland
Sifter, Ash.....J. W. Ormsby
Sign-attaching implement.....G. A. Bell
Skate.....G. F. Eckart
Skate.....J. Nuttall
Skirt-drafting quadrant.....E. S. Eden
Slip-mill.....W. R. Macklind
Smoke-consumer, Automatic force-draft...J. R. Harrell
Smoker's pipe.....T. J. Stockton
Snaffle-hook.....F. P. Avery
Soap dispenser, Liquid.....W. T. Carter
Soaps, Medicinal.....W. Schoeller et al
Spanner with automatic parallel locking device.....E. F. Maitrngue
Sparking plug.....K. C. Wideen
Speed varying and reversing mechanism....L. and L. R. Bleitz
Speedometer....J. H. and E. W. Bullard
Spinning device.....W. B. Gilmore
Spinning-machine.....F. S. Culver et al
Spittoon.....W. C. McGinnis
Sprayer, Tree.....F. M. Thomas
Spring-wheel, Vehicle.....C. F. Quick
Stacker and elevator, Straw.....A. Rosenthal

Stamp-affixer.....M. E. Harwell
Steam-boiler.....E. P. Hanahan
Steam-generator, Water-tube.....
.....A. G. Burkhardt
Steel manufacture.....J. M. Darke
Steel, Manufacture of.....W. R. Walker
Stereopticon side-carrier..M. A. Goodspeed
Stove.....C. L. Gohmann
Stove attachment.....M. Emmett
Stove, Camping.....R. Schmidt
Strainer.....C. G. Guttinger
Stropping-machine.....A. A. Pratt
Stump-puller.....E. C. Anderson
Sugar-juices, Apparatus for treating.....
.....E. W. Deming et al
Surgical appliance.....S. G. Tibbs
Surgical bandages, corsets, &c., Strap for..
.....M. C. Ninde
Snspenders.....H. H. Small
Table and tray-stand, Combined.....
.....A. W. Whitney
Table-slide.....C. Bremaker et al
Tank emptying apparatus.....S. F. Miller
Telephone-dictating machine or apparatus..
.....O. F. Falk
Telephone, Magneto.....O. M. Leich
Telephone noise-excluder and current-saving device.....W. E. Burt
Telephone signal attachment.....
.....W. F. Mikolasek
Telephone system..2 pats....C. S. Winston
Telephone system.....H. G. Webster
Telephone system, Private branch intercommunicating.....N. H. Holland
Threshing-machine and vehicle coupling...
.....J. E. Blom
Threshing-machine feeder.....J. S. Walch
Tile-cutting machine.....W. E. Smith
Time-controlled mechanism..A. W. Bailey
Time indicating and recording machine or apparatus.....F. M. Russell et al
Tire and stud therefor, Antiskid.....
.....C. S. Beebe
Tire-armor.....P. M. Stephan
Tire for wheels, Spring...S. A. Schewczik
Tire-protector.....J. A. Bailey et al
Tire-protector.....C. W. Jasmer
Tire-shield.....H. F. D. Meyer
Tire, Vehicle.....E. W. and P. J. Evans
Tire, Vehicle.....J. A. Keller
Tobacco-pipe.....W. H. J. Downey
Tongs.....G. E. Thurston
Tongs.....J. W. Lewis
Tool-fishing apparatus.....A. C. Graham
Tool-handle.....W. Cooper
Tool-holding device.....T. R. Brooks
Toy.....J. A. Eeton
Toy truck-cart.....H. T. Kingsbury
Toy wheeled trap.....H. T. Kingsbury
Track-closer, Automatic.....J. Nueske
Track-drill.....C. K. Pickles
Track-laying machine.....J. R. McGiffert
Track-sander.....W. J. Beattie et al
Train system, Electrical.....J. R. Sloan
Transferring-case for valuables..A. Powell
Transmitter.....H. S. Mattison
Transmitter-mouthpiece.....O. F. Falk
Transom-bar, Metal.....J. T. Ferres
Trim-clamp.....N. A. Nilson
Trip-coupling.....J. M. Walker
Trousers.....L. and W. Levy
Trousers-belt-supporting device.....
.....J. D. Honck
Truck-adjusting mechanism.....T. E. Lind
Tube-forming machine...T. A. Edison et al
Tube-lifter.....A. N. Russell
Tunnel construction.....S. J. Sydney
Turbine.....J. Brown
Turbine controlling means....H. G. Sahlin
Turbine, Steam.....A. A. Holle
Turbo-generator construction..C. H. Smoot
Turn-table.....L. J. Sleph
Turner.....J. A. Sweeting
Turnstile.....O. W. Brenizer
Twine-cutter.....O. C. Arnold
Twyer, Blast-furnace.....R. W. McGarvey
Type-writing machine.....C. Gabrielson
Type-writing machine.....E. E. Barney
Umbrella-support.....A. E. Shuster
Vacuum-cleaner cover..T. Wiedemann et al
Valve.....C. C. Palmer
Valve.....C. F. Siegrist
Valve, Air-vent.....G. D. Hoffman
Valve, Antiscald.....W. H. Dehn
Valve, Automatic.....A. de Dion et al
Valve, Double-seat.....W. Nachtigall
Valve for air-brakes, Safety....T. B. Coyle
Valve for ammonia-compressors, Check....
.....P. Neff et al
Valve, Manually-operated check.....
.....R. Trautschold
Valve mechanism.....E. V. Anderson
Valve-operating mechanism for steam-traps
.....W. T. Powers
Valve-regulator, Corliss-engine.....
.....S. Strommerson
Valve-reseating device.....A. M. Lockett
Valve, Rotary steam.....S. W. Perry
Valve, Three-way.....C. L. Straub
Valve, Union check.....H. H. Grob
Vapor-burner.....H. V. Dresbach et al
Varnishes and for impregnation and insulation and their production, Substances to be used as.....G. G. Diesser
Vehicle automatic brake, Wheeled.....
.....G. W. Northrop
Vehicle driving-gear, Motor.....W. Bushey
Vehicle-gearing.....J. J. Charley
Vehicle or roller-coaster brake, Wheeled..
.....C. D. Orcutt
Vehicle running gear, Motor....H. E. Wray
Vehicle-top bow-holder.....C. L. Blair
Vehicle-wheel.....G. Dorffel
Vehicle-wheel, Cushion.....
.....L. R. and R. L. Gruss
Vending-machine.....A. Downey
Vending-machine check-controlled mechanism.....W. H. McMannus
Ventilator.....H. P. Vose
Wagon, Dump.....A. C. Baker
Wall, Storage-structure.....C. A. Perfect
Warp-machine, Traverse..H. W. Bloemaker
Washing-machine.....L. Wagoner
Washing-machine cylinder....J. A. McKee
Washtub waste connection..T. G. Andrews
Water-gage.....G. H. Goodwin
Water-gate.....G. E. Kellar
Water-heater.....C. J. Karnopp
Water-heater.....A. W. Brand
Water-level controller.....E. P. Noyes
Water-wheel.....T. A. Macdonald
Wave-motor.....A. W. Reynolds
Waxing apparatus.....I. B. Barrire
Weaner, Calf.....C. B. Wagner, Jr.
Weighing liquids in storage-tanks, Apparatus for.....T. C. J. Hillmer
Weighing-machine.....J. W. Allison
Weighing-machine, Automatic.....
.....S. Ciarkowski
Welding and repairing, Electric..2 pats...
.....H. L. J. Siemund
Welding composition.....H. L. J. Siemund
Wheel attachment.....J. C. Butterfield
Wheel rim, Demountable vehicle.....
.....F. N. Bendelari
Wheel rim, Removable vehicle..A. Michelin
Winch.....H. N. Covell
Winding-reels, &c., when a predetermined length of material has been wound thereon, Apparatus for stopping....J. Clayton
Window-chair.....J. J. Ronan
Window-sill, Metal.....J. T. Ferres
Window-ventilator.....H. A. Dirkes
Work-holder.....J. Demarchi
Wrapping machine, Package.....
.....J. H. Felmlee et al
Wrench.....M. G. Ewer
Wrench.....L. Kovatch
X-ray apparatus.....H. F. Waite
Xylophone-stand, Collapsible.....
.....C. B. Wanamaker
Zeroising mechanism.....A. J. Postans

DESIGNS.

Badge or similar article.....J. G. Hardy
Box-mat.....R. Gair
Chafing-dish stand.....A. H. S. Swan
Lace edging.....W. E. Keach
Lamp-post.....W. W. Bosworth
Light shade, Artificial.....K. Booth
Medal.....E. Mullan

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Accumulator, Steam-regenerative.....
.....A. C. E. Rateau
Acid, Making hydrocyanic..O. Liebknecht
Adding and listing machine..J. G. Vincent
Adding-machine.....J. G. Vincent
Addressing-machine.....E. H. Frey
Addressing-machine.....I. R. Hutchinson
Adjusting clamp or nut.....J. L. Bernard
Aerial machines, nautical ships, vehicles, and other purposes, Apparatus for.....
.....J. W. Clond
Aeroplane launcher and lander.....
.....G. Geraldson
Air-brake systems, Coupling for.....
.....V. P. Taylor
Air-compressor.....F. Boercker
Air-treating machine.....C. E. W. Dow
Anesthetics, Apparatus for administering..
.....M. J. Wunderlich
Animal-trap.....C. Shaeffer
Antiskidding and traction device for automobile and other wheels.....W. Reagan
Antiskidding device.....W. Reagan
Ash-pan.....H. S. Lloyd
Auger, Earth.....M. Hardsock
Awning.....E. F. Opie
Axle-lubricator.....J. F. Gross
Bag-holder.....L. Hanson
Baling-press.....G. E. Jackson
Barber's chair.....C. Pfanschmidt et al
Battery plate, Secondary.....C. Busch
Bearing, Ball.....O. von Shutz
Bearing, Ball.....G. O. Leopold
Bearing, Roller.....J. H. K. Kirner
Bed-tent.....S. G. Wilson
Beds, Head and back rest for..J. S. Visger
Beer-case seal-lock.....F. B. Williams
Beverages, System for cooling and dispensing.....M. W. Marsden
Billiard-bridge.....J. N. McIntire
Binder-frame.....L. P. Dixon
Blade-holder.....F. J. Nash
Blank-making machine, Skived.....
.....L. L. Hartwell
Blotter.....M. F. Montague
Blowpipe and operating the same.....
.....H. C. Harrison
Boat gearing, Motor.....T. P. Cole
Bobbin or spool.....F. G. Snyder et al
Boiler-tubes, Tool for spreading.....
.....A. P. Gerald
Book-holder.....A. G. Bauer
Boot and shoe.....J. Jeperson
Boots or shoes and producing same, Covered strap for.....L. A. Gale
Boring-machine.....J. P. Weddle et al
Bottle, Milk.....H. R. Schiff
Bottle, Non-refillable.....J. O. Walsh
Bottle, Non-refillable.....J. B. Zorn
Bottle, Nursing.....F. Herb
Bottle-washer.....H. Krause
Bouquet-holder.....E. W. Cowdrick
Box-end, Wire-bound.....F. A. Prahl
Box-lock.....J. F. Beechler
Box-tops, Mechanism for forming finger-notches in.....N. E. Laroeque
Brick-machine.....W. B. Ferris
Broom-handle.....H. Post
Brush, Fountain.....J. W. McCardle et al
Bucket, Dumping.....C. W. Hunt
Burglar-alarm.....S. Hambourger
Button-attaching means.....H. Rosenthal
Button, Ivory.....W. G. Schimmel
Buttoner, Lasting..P. F. W. C. Krippendorf
Calculating-machine.....B. R. Webster
Calendar.....C. T. Ehmling
Calendar, Perpetual.....C. E. Boillot
Calendar, Perpetual.....C. D. Kendig
Can-heading machine.....E. Norton
Car-brace.....J. E. Ogden
Car-brake.....F. Trexel
Car-door.....B. J. O'Neill et al
Car-door fastener.....C. B. Patch
Car-fender.....G. Hipwood
Car grain-door.....F. A. McComber
Car-roof, Ontside metal.....P. H. Murphy
Car-sheathing.....W. J. Boyer
Car-step, Folding.....S. K. Gerhardt
Car-underframe.....R. W. Davies
Cars, Device for preventing theft from....
.....E. L. Pence
Carbureter.....W. C. Westaway
Card, Catalogue.....W. B. Mehl
Carton.....M. E. Van Luven
Caster.....M. B. Schenck et al
Casting machine, Roller-cover...A. Mattick
Cattle-guard.....H. H. Herring
Cattle-guard and halter, Combined.....
.....J. J. Steele et al
Cattle-guard-operating mechanism.....
.....W. Terry
Ceiling-bend for supporting pipes.....
.....W. U. Griffiths
Celery-digger.....W. Stoker
Cement-block machine....L. and W. Hage
Cement-tile machine.....W. Johnson
Centering-machine.....R. Milne
Chair.....R. R. Reed
Chairs, Combined head-rest and server for barbers'.....C. Pfanschmidt
Child's chair.....T. W. Washburn
Chimney-cleaner.....G. S. Stuart
Chlorid solutions, Producing clear stannic
.....E. A. Sperry
Chuck, Spring.....B. M. W. Hanson
Churn.....J. E. Earnest, Jr.
Churn.....J. L. Dangerfield
Cigarette-tip.....H. P. Strause
Circuit-closer, Mobile.....F. E. Brown
Circuit-controller-retarding device.....
.....E. A. Halblieb
Clamp.....L. J. Everest
Clock-dial.....C. L. Newland
Clock, Secondary.....M. W. Obermiller
Closet attachment, Dry and water.....
.....W. B. Webb
Clothes-drier.....O. R. Gale
Clutch, Friction.....J. Yocom
Coat-front, Lady's canvas.....S. Decker
Coats, Support for the fronts of.....
.....W. H. Garlock
Cock, Blow-off.....R. W. Erskine
Coin-operated apparatus.....C. Perdrisat
Coking coals.....L. L. Summers
Collars, Machine for blocking horse.....
.....J. B. Gathright
Comb.....A. H. Lent
Compartment-case.....C. A. Stndds
Concrete-block-making machine.....
.....F. I. Bennett
Concrete piles, columns, and the like, Machine for making reinforced.....
.....A. C. Chenoweth
Condiment-shaker.....C. S. Olson
Controlling apparatus, Automatic.....
.....R. W. Scott et al
Conveyer.....E. E. Vrooman
Cooker, Fireless.....B. Kellogg
Corset, Apparel.....D. Kops
Cottage or tent-house.....P. A. Kessler
Cotton chopper and cultivator, Combined..
.....J. F. Hughes
Couch.....W. Diemer
Couch, Foldable.....C. H. Mullen
Crank and yoke connection.....
.....H. P. Wellman
Crate, Collapsible.....C. R. Brown
Crate, Knockdown..B. G. and R. M. Hutton
Culinary utensil.....W. E. Morrison et al
Cultivator.....J. B. Hoober
Cultivator, Adjustable....E. M. McKissick
Curtain-fixture.....C. L. Hopkins
Curtains and the like, Forming holes in...
.....F. S. Carr
Cuspidor.....S. Borisz
Cut-out, Automatic.....V. G. Apple
Cutting-machine.....C. H. Reeder
Dam.....H. L. Cooper
Dams, Movable crest for..P. and A. Savard
Davenport.....J. J. Vetter
Dental articulator.....M. Howard
Dish-washing apparatus.....B. F. McMinn
Display-box.....I. W. Levi
Display-rack.....W. Shannon
Distilling liquids.....L. O. Sherman
Distributing-board....L. H. Nielsen et al
Dividing and banding machine..A. G. Bauer
Door-fastener.....J. R. Mellott
Door-stop.....W. C. Knapp
Doors, panelings, or the like, Construction of.....H. C. Badder
Dowel.....R. Sieper
Draft-gearing, Equalizing....L. J. Jackson
Dredge.....W. F. Howe
Drill and drill-shank.....M. Hardsocg
Drills, Making twist.....E. C. Peck
Dust-catcher.....V. E. Edwards
Dusting apparatus.....F. C. Stevens
Ear-phone receivers, Adjusting means for the regulation of the intensity of sound for.....R. J. Barber
Egg-cup.....A. G. Wettergren et al
Electric-cable terminal (Reissue).....
.....C. W. Davis
Electric furnace.....J. Harden
Electric furnace.....J. H. Reid
Electric machine, Dynamo.....H. G. Reist
Electric switch.....J. Keefe
Electric wires, Apparatus for coating.....
.....O. C. Spurling
Electrical fitting.....F. A. Swan
Electrical protective apparatus, Self-cleaning.....F. R. Parker
Electrofluid-pressure apparatus.....
.....C. R. Dallenbach
Electrolytic cell.....P. McDorman
Elevator-car doors, Means for locking....
.....T. H. Straley
Elevator signaling apparatus.....
.....R. A. Griswold et al
Elevator-well gates, Automatic closing device for.....A. Runkel
Emergency-coupling.....F. B. Meyers
Engine breather, Explosive.....
.....W. A. Frederick
Engine igniter, Explosion...E. W. Stevens
Engine induction-conduit, Explosion.....
.....J. G. Utz
Engines, Cooling arrangement for motor-boat.....A. S. Morgan
Eraser and pencil-sharpener, Combination
.....C. H. Marshall
Explosive.....W. C. McLaughlin
Fastening device.....E. Erickson
Faucet or cock.....J. Davis
Faucet, Self-closing.....J. P. Farley
Feed-bag.....T. C. Adams
Feed mechanism.....D. C. Griggs et al
Feed-water heater, Boiler....W. C. Barnes
Fender.....O. O. Graff
Fertilizer-distributer.....C. Ruof
Fertilizer for cotton, Insectifuge.....
.....R. G. White
Fertilizers, Making stable cyanamid.....
.....S. Peacock
Filaments for electric lamps, Manufacture of.....F. J. Planchon
Film-pack adapter.....J. Goddard
Filter, Water.....V. B. Hagg
Filtering apparatus, Sewage.....B. Wilkie
Firearm.....A. C. Wright
Firearm.....A. L. Audette
Firearms, Guard or deflector for side-ejection shoulder.....H. B. Febiger
Fishing apparatus.....H. A. Gelsinger
Flagstaff.....E. S. Mowry
Flanges, Device for setting and removing..
.....R. Johnson
Fluid-propelled direct-acting engine.....
.....W. Mauss
Flush attachment plug-receptacle.....
.....C. D. Platt
Fly-catcher.....J. N. Dean
Flying-machine.....J. H. Buss
Folding box.....G. B. Streit
Form, Garment.....I. Levin
Fruit-packer's table.....F. Rathbun
Fruit-picking bag.....F. J. Burch
Fuller's earth, Utilizing spent.....
.....N. Sulzberger
Furnace.....A. Arthur
Furnace.....J. B. Ladd et al
Furnace-door.....C. J. F. Johnson
Furniture.....J. Haas
Furniture-legs, Trick-plate for.....
.....E. N. Humphrey
Fuse attachment.....C. C. Myrick
Fuse-box.....J. W. Bird
Fuse, Inclosed electric.....B. S. Luther
Fuse, Scratch-headed..C. D. McPhee et al
Fuse tester, Electric.....J. H. Cary
Game apparatus.....E. P. Meeker
Game apparatus.....G. Zint
Game apparatus.....A. J. Krug
Garment-supporter.....C. J. White
Gas-burner.....M. Dean
Gas-burner.....L. Mellinkoff
Gas-controller.....F. E. Youngs
Gas-controlling device.....H. Epstein et al
Gas electrically, Apparatus for treating..
.....C. L. Gerrard
Gas-engine, Two-cycle.....R. J. Leach
Gas-holder heating apparatus.....L. Knorr
Gas-lighter, Automatic.....J. C. Landes
Gas-ports, Water-back for....A. Wood, 3d
Gas-producer.....J. O. E. Trotz
Gas-producer.....W. C. Finck
Gas-producers, Water-regulator for.....
.....E. Sandner
Gas-purifier.....H. I. Lea
Gas, Recovering naphthalene from.....
.....R. H. Bots
Gas-scrubber.....E. Yawger
Gear lock, Differential.....A. M. Wolf
Gearing.....E. W. Blum
Gearing.....R. Milne
Gearing, Transmission.....C. W. Parker
Gearing, Transmission.....K. Probst
Generator.....J. Smith
Glass-furnace and manufacturing glass articles therein.....R. S. Pease
Glass-rolling apparatus.....A. Meyer
Glass-tank.....R. S. Pease et al
Go-cart, Collapsible.....M. B. Lloyd
Goggles, Motorist's....R. Esnault-Pelterie
Governor, Automatic cut-off.....O. Onsrud
Grading machine, Road.....C. O. Wold
Grain-separator feed-regulator.....
.....W. W. Keran
Gravel-trap and air-chamber.....E. Cole
Grinding machine, Ball.....C. A. Hirth
Guard.....R. Pollak
Gun-sight.....S. Bishop
Gun, Single-trigger double-barrel sporting..
.....R. J. Petersen
Hacksaw-machine.....F. S. Bradley
Hair puff and means for supporting the same.....M. Close
Hammer, Pneumatic.....J. E. Burtle
Hammock and tent, Portable combination
.....E. B. Meredith
Handle.....L. J. Allison
Harness-loop.....J. D. Padgitt
Harrow, plow, and hoe, Combination....
.....M. B. Haywood
Harrow, Rotary.....W. H. Keen
Harvester.....A. N. Hadley
Hasp.....J. H. Lawrence
Hat-frame-making machine.....H. Silbert
Hat-pin.....J. Irwin
Hat-securing device.....W. G. Weston
Hay-press.....J. H. Sawyer
Heater combination, Electric....J. I. Ayer
Heating and lighting system, Oil-gas.....
.....W. N. Best
Heel-breasting machine.....J. Gouldbourn
Heel, Cushion.....I. Taillefer
Helmet, Respiratory.....H. Bentz
Hinge.....R. W. Hardy
Hitching device.....A. E. Bretz
Hoe, Wheel garden.....T. H. Humphreys
Holdback.....A. F. Tank
Hop-picking machine.....J. Trowbridge
Horseshoe.....J. Bovair et al
Hose.....E. T. Greenfield
Hot-water heater.....J. Cooper
Humidifying apparatus.....F. W. Parks
Hydrocarbon burner, Fluid....D. P. Moore
Ice-cutting machine.....C. Keller et al

Hygrometer for regulating humidifying and heating systems.....S. W. Cramer et al
Igniter.....A. De Rose
Incandescent lights, Shade and reflector for .....G. A. Ringler
Index, Card.....W. J. Lowder
Indicator.....B. H. Wike
Inking device.....E. P. Sheldon
Insect-catcher.....A. E. Crabtree
Internal-combnstion engine..C. Y. Knight
Internal-combustion engine....A. F. Scott
Internal-combnstion engine..T. J. Shanahan
Internal-combnstion engine...T. A. Martin
Irrigation, Diffnsion-block for snbsoil..... .....B. Ziller
Jack.....L. Willour
Jack.....J. Mosiman
Jack and truck, Combined..2 pats..... .....W. Beckert
Jack-post, Self-bracing.....W. Schrier
Jar-closure.....D. Knowlton
Journal-box.....W. G. Dunham
Knife.....L. D. Gorsline
Ladder attachment, Step....J. B. Gilmore
Ladder, Extension.....A. M. Ferguson
Lamp.....F. Webb
Lamp gas-burner.....H. D. Penney
Lamp, Incandescent-mantle..C. M. Lungren
Lamp socket, Electric.....J. H. Goehst
Lantern-frame.....A. H. Handlan, Jr.
Lantern-regulator, Automatic....E. C. Ives
Lasting machine, Red (Reissue)..... .....F. Holbrook
Lasts, Forming.....E. J. Prindle
Latch, Refrigerator.....F. L. Ellsworth
Lathe, Portable hand-driven turning..... .....W. D. Verschoyle
Lathe tool-support, Turret..... .....B. M. W. Hanson
Lathe tool-snpporting attachment, Turret.. .....C. L. Goodrich
Lathe turret-feed stop.....C. L. Libby
Lawn-sprinkler, Automatic..M. S. Lantzer
Leather, Manufacturing.....J. T. Smith
Leather or the like, Machine for sorting or grading pieces of.....P. Heldmann
Ledgers, Name-leaf for.....T. E. Smith
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Lens grinding and polishing machine..... .....K. Liegandt
Lever mechanism, Platform..... .....F. H. Buckingham
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Life-preserver.....W. Schweikert
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Logging-jack.....G. D. Bacon
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Loom stopping mechanism...O. A. Sawyer
Lumber-load protector....F. E. Eastabrook
Mail-box signal.....W. E. Harmon
Mail distributer and collector, Automatic.. .....J. H. Folts
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Massage-machine.....W. G. Trautman
Match-box.....E. C. Haymaker
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Measure indicator, Liquid..... .....L. E. Carruthers
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Metallurgical heating.....B. E. Eldred
Micrometer for spark-coils, Adjustment.... .....E. B. Jacobson
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Mill-floor construction, Reinforced wooden .....C. A. M. Praray
Milling-machine attachment..... .....C. L. Grohmann
Mine-exit.....C. W. White
Mining apparatus.....A. Washburne
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Mining-machines, Chain for....C. E. Davis
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Mold.....H. D. Streator
Molds, Treating the interior surfaces of.. .....A. A. Schmidt
Motor attachment, Vehicle....W. S. Jones
Muffler.....N. Schwartz
Music-leaf turner.....G. H. Hancock
Music-playing instruments, Tracker construction for mechanical....F. C. White
Music-rolls, Respooling device for..... .....G. H. Davis
Musical instrument, Stringed..C. S. Weber
Nest and perch, Combination..H. W. Watts
Noise-arrester.....C. W. Waller
Note-sheet-winding apparatus..... .....F. C. White
Nut-lock.....H. L. Reed
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Oil-bushing and packing-ring..... .....J. J. Coyne et al
Orange and lemon squeezer..L. S. Haekney
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Ore blocks for the briqueting-furnace, Apparatus for forming.....G. Grondal
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Organ-pipe.....W. E. Haskell
Outlines of a form, Reproducing..... .....E. R. Sextone
Oven, Bake.....L. J. Kolb
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Paper-handling machines, Controller for... .....H. C. La Batt
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Paper tubes, Machine for the production of.....J. Gohy
Pencil-sharpener and clamp..... .....J. M., M. A., and T. H. Carter
Perforating-shear.....C. Carlton
Permutation-lock.....J. P. Crosthwait
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Piling, Metal sheet....C. C. Conkling et al
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Plow-frame.....W. H. Arnold
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Pneumatic action.....B. T. Treahy
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Porous pipe and manufacturing the same.. .....R. L. Ziller
Portable reel.....G. Hollandsworth
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Pottery product.....M. W. Marsden
Power transmission, Electrical..... .....J. G. P. Thomas
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Press.....H. D. Spencer
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Pump.....W. H. Clark
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Rail, Lap-joint T-iron.....F. W. Becker
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Range-finder.....D. Schneider
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Refrigerating apparatus.....J. E. Starr
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Resilient wheel.....J. G. Daw
Ribbing and expanding machine..... .....T. H. Kane
Roasting-furnace.....C. Robinson
Rolling, Art of..2 pats.....C. M. Grey
Rotary engine.....A. C. Savidge
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Sad-iron heater.....L. J. Jackson
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Saw-shifter for gang-edgers..... .....J. T. Stoddard
Saws, Oscillation for gang....J. L. Graham
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Scaffold-bracket.....C. C. Reeder
Separation of constituents, Apparatus for the uninterrupted.....F. W. Ilges
Separator.....C. C. Inman
Sewage, &c., Automatic discharger for.... .....J. F. Quinn
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Sewing-machine.....H. F. Moore
Sewing-machine feed mechanism..... .....A. L. Dawson
Sewing-machine gage.....H. J. Hamlin
Sewing-stand.....L. B. Laridon
Sharpener, Scissors.....F. M. Bennett
Sharpening and setting device for scraper-blades.....J. Miotke
Sharpening device, Safety-razor..... .....R. W. Rosenthal
Shears.....D. and D. C. Wheeler
Shed for aerial vessels.....J. Fechtig
Sheet-feeding machine.....H. C. La Batt
Sheet-making maebine.....C. Barbieri
Sheets, Making.....C. Barbieri
Shoe.....A. Yandoli
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Skate, Roller.....H. Simon
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Soap, Manufacture of bleached..... .....F. Wiedermann
Soap stick and brush, Combined..... .....A. L. Brown
Solder, Aluminum.....J. Silver
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Sparking plug.....W. A. Einlg
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Spray plug, Fractional.....W. G. Taylor
Spraying device.....G. A. Urbach
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Square, Steel.....J. Weston
Stacker, Hay.....W. D. Roberts
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Stamping letters and other postal matter, Apparatus for.....A. Gerstenkorn
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Stanchion, Cattle.....F. Woodmancy
Steam-boiler.....A. A. Olson
Stockings, &c., preparatory to singeing, Device for removing creases from..... .....F. C. and A. Scholler et al
Stop-motion, Twister.....T. H. Smith
Store-front construction.....F. J. Plym
Stove, Vapor.....A. A. Warner
Stovepipe-joints, Locking means for..... .....A. Blaha
Street-surface-cutting device..A. Rosenholz
Sugar manufacture.....H. C. Christianson
Suit-case.....I. E. A. Jensen
Sulfur, phosphorus, and other impurities from coal, ore, &c., Extracting or eliminating.....L. L. Summers
Support, Vertically-adjustable..... .....W. B. Cogger
Sweat-band.....F. J. Lauermann
Switch throwing and locking device..... .....S. Swann
Switch-throwing mechanism...H. Schaeffer
Talking-machine.....T. Kraemer
Tamping mechanism.....G. W. Pritchett
Tank-cover.....A. A. Kramer
Taper attachments, Mechanism for adjusting cross-slides for.....B. M. W. Hanson
Tax-rate sheets, Holder, adding-board, and indicator for.....H. F. Heckert
Telegraph systems, Coherer for wireless... .....C. Walker
Telephone-receiver holder.....J. Hitchcock
Telephone system.....C. T. Patterson
Telephone-transmitter (Reissue)..... .....W. E. Harkness
Telephotography.....O. O. Kruh
Temperature alarm, High.....W. G. Pierce
Temperature-compensating mechanism..... .....A. Bonnet
Testing-machine.....J. W. Carter
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Tire-fastening device.....R. S. Bryant
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Top, Spinning.....W. Hollendung
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Voting-machine, Vote-printing..... .....D. L. Neweomb
Wagon.....M. Kraeski
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Weather-strip.....J. Kammerer
Weaving machine, Slat.....E. Walton
Weighing device.....E. S. Kneeland
Well adjuster, Oil.....L. C. Moore
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Wood-scoring device for planes and the like .....C. Bodner
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Dish or similar article, Covered..... .....H. Creange
Jar.....A. J. Sanford
Plaque.....A. G. Spalding
Refrigerator.....J. Colonel
Spoon, fork, or similar device..... .....G. L. Crowell, Jr.
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Antiskidding chain.....J. I. Edgerton
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Blacksmith's hardy.....W. B. Robeson
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Bottle-making machine.....L.. P. Brown
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Bottle-washing machine....H. W. Van Leir
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Brake.....O. M. Taylor
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Brake-operating mechanism...J. F. Kieffer
Bread-making machine....V. A. Hellstrom
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Brick-molds, Method or system of conveying and dumping.....W. E. Loomis
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Bridge-locking means, Bascule..... .....A. H. Scherzer

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Buckle or elastic link.....J. J. Jacobs
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Building-block.....E. M. Campfield
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Camera film attachment.....A. M. Vale
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Capstan-screw.....G. A. Moore
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Car-door lock.....G. E. Allison
Car-door structure.....B. D. Jones
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Car rotating light, Railway....T. A. Teate
Car-seat head-rest.....H. W. Bowman
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Cars, Buffer for automatic couplings for railway and street.....L. Boirault
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Carbureter.....J. W. Parkin
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Coin-controlled lock.....I. C. Strabley
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Column.....A. W. Ford
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Concrete structure, Reinforced.....W. P. Cowles
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Cotton-chopper..J. E. and H. L. Campbell
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Cover for culinary utensils....E. J. Hansen
Crane, Overhead traveling..2 pats.....C. L. Taylor
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Current-motor and towing apparatus.....T. Warren
Currents, Device for steadying rectified.....P. H. Thomas
Curtain-rod.....H. H. Malkasian
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Desk, Knockdown.....J. W. Campbell
Display-rack.....C. C. Geiger
Domestic press.....L. N. Himebaugh
Door and gate hanger.....H. Todd
Door-stop.....J. W. Hagerty
Draft appliance.....H. C. Huff
Draft-regulator, Automatic.....L. Snell
Drag, Road.....J. D. and R. E. Adams
Draw-head.....G. C. Abbe
Drawer and construction for show and stock cases.....E. W. Warson
Dry separator.....A. W. Ringland
Drying wet material, Process and apparatus for.....W. Bratkowski
Dust-collector.....O. M. Morse
Dust-proof joint.....D. E. Hunter
Dye and making same, Vat.....A. Schmidt et al
Dyes and making, Gray vat.....H. Broniatowski
Edge-trimmer.....J. A. Hagerman
Egg-separator.....C. E. Woodrow
Electric safety-switch.....C. D. Platt
Electrical apparatus.....H. T. Olsen
Electrical-distribution system..2 pats.....W. A. Turbayne
Electrical-distribution system and method.....P. H. Thomas
Electrode and making the same.....H. J. J. Jaburg, Jr.
Electrodes in electric furnaces, Means for regulating.....J. H. Reid
Electromagnetic drill.....F. E. Baney
Electroplating-tank.....E. R. Williams
Electrothermal garments, Foot-warming attachment for.....B. R. Charles
Elevator.....C. G. Armstrong
Elevator safety-lock.....W. R. West et al
Emergency-coupling.....J. G. Jackson
Engine having rotary piston..F. C. Kruger
Engine starting means, Hydrocarbon.....R. Odell
Engine timer, Gas.....B. M. Aslakson
Engines, Drum for donkey.....P. Soule
Engines, Means for electrically heating water-cooled combustlou..A. A. Low et al
Engines, Water-jacket for explosive.....J. F. aud H. E. Dodge
Envelop, Safety.....B. J. Cagnoii
Explosiou-engine.....M. Sears
Explosive compound.....J. Burrows
Explosive-engine.....J. F. Woolf
Eyeglass-holder.....F. R. Bishop
Fabric-impregnating apparatus.....E. De Journo
Faucet.....R. A. Kiena
Faucet, Beer.....C. M. D. Gross
Faucets, Refining wooden....A. J. Ketelsen
Feed arraugement for tube-boilers.....L. M. G. Delaunay-Belleville
Feed-water regulator.....R. M. Hunter
Feed-water regulator.....T. J. Quirk
Fence.....D. E. Williamson
Fence-clamp.....B. F. Steuart
Fence-post.....D. Darling
Fertilizer-distributer and seed-planter, Combined.....A. C. Lindgren
File-cabinet.....R. W. Emmons
File spring-clamps, Device for securing....O. Bomboru
Filing-cabinet.....J. B. Potter
Filter, Rain-water.....J. F. Riedy
Filter, Water.....A. A. Danielson
Filtering apparatus for washing slimes, &c.....J. F. Webb
Fire-escape.....M. F. Welch
Fire-extinguisher.....C. Brent
Fire-stop for corrugated-metal shutters.....J. G. Wilson
Firearm.....M. Schrader
Fishing, Spinner for.....F. and H. Lee
Flat-iron heater..W. Van Pietersom et al
Fluids, Apparatus for compressing elastic..C. H. Stuart et al
Flnshing mechanism, Automatic.....C. H. Phillips
Flying apparatus.....J. Schulke
Flying-machine.....F. B. Kummer
Flying-machine...C. E. S. and F. R. Burch
Flying-machine.....H. C. Gammeter
Flying-machine, Aeroplane....J. M. Biggs
Food, Making malted.....S. Felix
Forming implement.....J. H. Gee et al
Frog, Guarded.....R. P. Delaney
Gage.....H. R. Stackhouse
Gambrel.....P. Malmgren
Game apparatus, Round..... P. J. Hansen
Game or puzzle device.....O. Weston
Garbage-tank.....J. C. Beckley
Garment-supporter.....J. Zeiman
Garter.....W. A. Koneman
Gas and electric-light fixture, Combined.....F. I. Hollingsworth
Gas-burner.....W. R. Wulfeck
Gas-check pad.....G. Gerdom
Gas-engine.....B. M. Aslakson
Gas-feed for vacuum-tubes, Automatic....D. M. Moore
Gas-generating apparatus.....A. D. Brasson et al
Gas-heated iron.....J. H. Brownlee
Gas, Method of and apparatus for compressing.....A. W. Fischer
Gear, Changeable sprocket..G. H. Downs
Gearing.....H. M. Lofton
Gearing, Worm.....J. Lecoche
Glove, Fruit-picking.....D. W. Richardson
Gold washing and separating machine.....E. Randolph
Grader.....J. W. Beasley
Grapple.....A. A. Phillips et al
Grass destroyer, Quack.....J. A. Paulson
Grass digger, Quack.....N. H. Hanson
Grate..2 pats.....D. Boies et al
Grinding machine, Electric..W. A. Ireland
Grooving-tool.....E. P. Dann
Gun.....S. N. McClean
Hair-dressiug apparatus....C. J. Packard
Hame-clip.....H. M. Dingsley
Hammer-drill..2 pats.....A. H. Taylor
Harrow attachment.....O. H. Chartier
Harvester-protector.....J. J. Graham
Harvesting-machine.....J. E. Hail
Harvesting mechanism, Beet..H. F. Barber
Hat box or carrier.....J. J. Foote
Hat-holder.....L. A. Tyler
Hay-loader.....T. G. Haines
Heaters, Pilot-light burner for water.....E. Rund
Heating apparatus.....J. N. Young
Heating-boiler.....A. G. Cripps
Heating-system, Steam.....H. K. and I. Z. Kriebel
Heating systems, Regulator for water....B. Humphrey
Heel-spring.....G. E. Swan
Hinge.....C. A. Miller
Hinge, Door.....P. Gottschall
Hog-ringer.....E. C. Tribby
Hose-coupling.....E. H. Wilson et al
Hose-supporter.....L. H. Zeigler
Husking-bench, Portable..R. E. Linnincott
Hydrant.....J. W. Stevenson
Hydraulic press.....F. H. Stillman
Ice-cream freezer.....J. Willmann
Ice-cream spoon.....W. B. Hogan
Index-tag, Removable.....J. O. Richards
Inhaler.....G. O. Ferguson
Inking device.....C. W. Canine
Insect-destroyer, Mechanical.....J. R. Truelove
Internal clamp.....W. J. Frost
Internal-combustion engine.....T. Reuter
Internal-combustion engine..G. Schimming
Invalid-rest.....H. Fuchs
Iron, Refining.....J. Flohr
Ironing-board.....C. B. O'Bleness
Ironing-board, step-ladder and clothes-rack, Combined.....A. A. Francis
Knitting-machine, Circular.....H. A. Housemann
Kitchen-utensil handle.....H. T. Moore
Lace, Shoe.....P. M. Hammaliau
Lamp.....J. E. Allen
Lamp and lauteru snuffer.....J. B. Case
Lamp-fixture.....W. S. Norton
Lamps, Machine for making the joint between the filament-support and the lamp-bulb in iucandescent electric.....J. Barrollier
Lamps, Safety transport-carrier for electric incandescent.....M. I. Cooper
Lamps, System of lighting and distribution by vapor..2 pats.....P. H. Thomas
Lard-cutter.....J. and H. P. Harmison
Lathe, Last.....H. F. Loewer
Leaf aud rubbish gathering machine.....J. F. Crowe
Leaf-turner.....S. E. Berliner
Lens-grinding apparatus.....H. Schmidt
Lenses, Grinding.....H. Schmidt
Lever-locking device.....F. S. Hardin
Life-buoy.....F. Woods
Lifting-jack.....S. M. Wenger
Lighting, Long-distance.....J. Lafitte
Lightning-arresters, Automatic attachment for cleaning round carbon or metal.....W. S. Hale
Locomotive smoke-stack.....A. F. Priest
Loom harness-frame.....H. W. Hakes
Loom-shuttle.....G. A. Draper
Loom weft-controller, Automatic.....W. D. Faulkner
Looms, Filling-feeler for.....G. A. Sontag
Magazine-holder.....C. O. Duffy
Magnesite, Preparing powdered....J. Lesse
Mail-bag catching aud delivering apparatus.....H. B. Kyle
Mail-box.....H. E. Carmony
Mail-carrier's box.....L. J. Andrews
Mailing-box.....G. Boden
Manicurist's finger-support...J. Macdonald
Manure-spreader attachment....J. Olander
Match-box.....J. E. P. Pender
Match-package.....T. von Deylen
Mattress-holder.....B. H. Rose
Maturing process and apparatus therefor..J. E. Carroll
Measuring and filling apparatus, Liquid...C. W. R. Culbertson et al
Measuring and vending device, Liquid.....H. G. Cardley et al
Melting-furnace.....J. A. Leiter et al
Metal-joiner.....J. Smith
Metals from their ores, Extracting..3 pats.....W. E. Greenawalt
Metallurgical furnace.....J. E. Jones
Milk, Apparatus for manufacturing artificially-soured.....J. Willmann
Millstone-dressing.....W. Van Nostrand
Mining apparatus, Coal.....A. Powell
Minnow.....J. E. Walters
Miter-box.....F. Peterson
Mixer.....W. O. Hickok, 4th, et al
Mixing-machine.....M. S. Shapleigh
Molded articles, Treating....W. M. Newton
Molding devices, Riser-lining for.....E. C. Washburn
Molding-machine.....M. L. Heyl et al
Monkey-wrench.....W. L. Reusch
Motive-power system.....A. Wilstain
Motor-base.....I. H. Spencer
Motor-meter, Electric.....A. Zipplies
Motors, Foot-controller for electric.....J. F. Hammond
Muffler.....H. C. Gibson
Musical horn.....G. H. White
Musical instrument, Mechauical.....F. L. Young
Nail-extractor.....E. Redmond
Needle-case.....R. A. Hankins
Nest, Hen's.....D. J. Weeden
Non-slipping device.....J. Hurst et al
Nut-lock.....R. M. Rager
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Nut, Lock.....M. J. Duffy
Nut-tapping machiue.....R. H. Smith
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Oiler, Force-feed.....G. E. Franquist
Optometer.....H. D. Reese et al
Ore-concentrator.....U. S. James
Oven, Electric.....L. F. Parkhurst et al
Oxygen-bath.....O. B. May
Oxygen, Generating.....A. Beltzer
Painter's extension-plank.....J. Riikonen
Pan-lifter.....I. Key
Paper cap.....P. J. Delzett, Jr.
Paper construction.....J. Carrotte
Paper-holder.....G. and H. R. Laube
Paper-tube-manufacturing machinery.....W. Kellner
Parer, Fruit.....F. O. Case
Pencil-holder.....A. B. Bly
Penholder.....L. J. Libbing
Perch.....D. Vanderkolk
Percolator, Electric..L. F. Parkhurst et al
Percolator, Reversible.....J. Berg
Peroleum products, Obtaining...H. Frasch
Petroleum, Refining.....J. C. Black
Petroleum, Refining.....C. 1. Robinson
Phonograph.....J. D. Bowers et al
Photographic-printing machine.....P. R. Johnson
Photographing on stone....J. E. Chambers
Piano.....F. Kranich et al
Pianoforte-action.....G. C. Snyder
Picture-card.....J. A. Weingart
Picture-projecting apparatus....M. Klaiber
Pile and making the same..J. H. Cranford
Pipe-end closure.....W. R. Jeavons
Pipe-union guard.....L. R. Fogg
Planter harrow attachment.....J. Ploen
Planter-legs, Rotary valve for.....P. B. Hamer
Plastic mold.....W. S. Proper
Plow attachment.....E. Davidson
Plows, Drag attachment for..J. E. Burton
Pneumatic actuating unit.....L. M. French et al
Pneumatic-apparatus connection.....I. H. Spencer
Pneumatic carrier-separator.....H. D. Waterhouse
Pneumatic-despatch-tube apparatus.....C. R. Libby
Pneumatic-despatch-tube apparatus..2 pats.....J. G. Maslaren
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Pneumatic-despatch-tube apparatus, Automatic switch for.....I. W. Litchfield
Pneumatic-despatch-tube-apparatus terminal.....C. S. Jennings
Polish-receptacle.....F. A. Ellis
Post-hole-digging machine.....L. J. Kerigan et al
Potato-piler, Automatic.....J. E. Hill
Potential-regulation system.....W. M. McConahey
Printing-machines, Folding delivery mechanism for.....W. Spalckhaver
Printing-press ink-roll-cleaning mechanism.....C. J. Robertson
Projectiles, Filliug for exploding..M. Glass
Proof-press.....G. L. Drummond
Propelling device.....G. Westinghouse
Pulley, Self-lubricating.....W. J. Withers
Pulley, Window-shade catch..A. N. Fries
Pump.....F. I. Du Pont
Pump, Double-acting.....H. B. Arnold
Pump, Screw.....E. S. Bennett
Pump, Tape-controlled measuring.....J. Albrecht
Punching and shearing machine.....G. F. Leighton
Radiator aud foot-warmer, Combined.....J. E. Jones
Rail-anchor.....C. D. Porterfield
Rail, Compound.....T. H. Wheless
Rail-joint.....W. P. and S. G. Thompson
Rail-joint.....S. R. Conroy
Railway.....T. H. Wheless
Railway construction.....T. H. Wheless
Railway, Elevated.....H. P. Hanson
Railway-joint.....A. E. Stine
Railway-spike.....J. Defenbaugh
Railway-ties from steel rails, Apparatus for making..2 pats.....W. H. Morgan
Railway-ties from steel rails, Making.....W. H. Morgan
Railway track-rail bond.....C. A. Parker
Rat or mouse trap.....C. Miller
Ratchet-wrench, Adjustable...O. Kornberg
Razor, Safety.....G. A. Logan
Reach-rod guide.....F. J. Cole
Reaper.....V. McLaughlin
Reboiler.....C. G. Carley
Rectal troubles, Device for the treatment of.....C. M. Seibert, Jr.
Refrigerating apparatus, Milk..C. N. Gille
Retouching-frame.....W. O. Dumke
Revolver.....O. W. Ringqvist
Revolvers, Subcaliber for.....E. B. Vedder
Revolving chair and like article of furniture.....H. G. Hunn
Ring member and applying it to the edge of an article, Producing a seamless.....J. J. Rigby
Rivet.....G. A. Goss
Roofing, Lock-seam for sheet-metal.....K. Roth
Rope-clamp.....A. C. Belling
Rotary engine.....J. H. Zimmer
Rotary engine.....G. H. Goss
Rotary engine.....F. Nearing
Rotary engine.....C. R. Ord
Rotary engine.....W. Ball
Rotary engine.....R. E. List
Rotary motor.....H. Van Ormer
Rubber to powder, Machine for reducing vulcanized.....T. Gare
Sad-iron handle.....C. P. Eichler
Safe.....J. C. Brucklacher
Safe-door.....H. C. Lowrie
Sand and gravel separator.....H. A. Frankenstein et al
Sash-cord fastener.....F. C .W. Kuehn
Sash-cord guide.....R. J. Eakle
Sash-holder.....D. P. McQuiston
Sash-securing means, Window.....J. E. Walter
Saw-handle.....B. B. Stepp
Saw-set.....W. M. Potter
Saw-set.....H. U. Kistner
Saw-set.....C. Schachtschneider
Scale, Automatic weighing...A. L. Duncan
Scrubbing-machine.....H. Brown
Seal, Mail-bag.....E. H. Humphrey
Seaming machine, Double.....O. Ostlin
Searchlight, projector, and the like.....H. Viertel
Seed shipping and display case.....B. D. Hawkins
Seeder, Force-feed.....J. H. Bauer
Sewing-machine attachment....P. Jacobson
Sewing-machine attachment for overseaming and the like.....G. J. Stevens
Sewing-machine spool-case.....J. Vanette
Shade and curtain fixture, Window.....L. O. Garraway et al
Sharpener, Drill.....R. A. Schmidt
Sheet-manipulating machine...A. R. Pribil
Shipping-can.....G. H. Peck
Ships, Means for preventing the rolling of.....H. Frahm
Shock-absorber.....A. Ellsworth
Shock-absorber.....A. M. Gray
Shock-absorber hanger (Reissue).....E. Flentje
Shoe.....J. Kruckewitt
Shoe.....A. Lutz
Shotgun attachment.....O. E. Michaud
Siphons, Charging-capsule for...D. Brescia
Skylight-bar.....J. E. Brogden
Slate-cleaner and sponge-pocket for school-slates.....A. Enge
Slate-picking apparatus.....F. H. Emery
Sled-propeller.....V. Bartos
Sleds, Running-gear for bob.....O. C. Simenson
Slicer, Bacon.....C. F. Nayer et al
Slug-detector.....J. W. Eiler
Smoke-consuming furnace.....P. J. and C. H. Kraetsch
Solder for incandescent-lamp filaments.....H. Kuzel
Sounds from sound-records, Means for reproducing.....C. L. Chisholm
Space-block.....A. A. Vardell
Spark-plug.....D. M. Tuttle

Spark-plug.....H. F. Provandie
Spectacle-glass, Achromatic..M. von Rohr
Speed mechanism, Change..J. F. Appinger
Speed mechanism, Change..L. D. Hubbell
Spirit-purifying process and apparatus....
.....J. E. Carroll
Spraying-solution mixer.....A. Macrae
Spring-wheel.....W. Brown
Sprue.....C. J. Prowse
Square, Folding.....P. Kriehbaum
Stamp-affixing machine.....S. B. White
Starting device, Automatic.....
.....C. T. Hildebrandt
Steam-generator, Slag.....G. Mitchell
Steam-superheater..G. J. Churchward et al
Steam-trap.....W. M. Sill et al
Steamer, Culinary.....S. J. Tourtellotte
Steel, Manufacture of manganese..2 pats..
.....W. S. Potter
Steering-indicator.....S. I. Andress
Steering mechanism.....J. H. Young
Stone, Manufacture of artificial.....
.....P. Hassack
Stove, Gas or vapor....A. E. Hartig et al
Stove, Slow-combustion.....E. Pollard
Strainer.....H. F. Weinland
Stud, Collar.....L. Smith
Studding for wall or ceiling boards.....
.....H. H. Burson
Submarine boring, blasting, pile-driving, block-setting, and like operations, Staging or support for.....R. A. A. S. Piercy
Surface-gage, Indicating.....
.....W. H. Reisner et al
Surgical instrument.....C. S. Cowie
Suspension-hook.....D. Williams
Switch-operating means, Electric.....
.....A. W. Bailey
Synchronizer, Automatic.....P. MacGahan
Tack-pulling machine.....A. Eppler
Tackle-block.....W. H. Stam
Tapping or drilling attachment.....
.....V. J. Wahlstrom
Tedder attachment.....C. J. Shoemaker
Telephone system, Intercommunicating....
.....A. Ekstrom
Telephone transmitter-faces, &c., Manufacture of.....V. Olb
Terminal connection.....E. P. Jahn
Testing device for fabrics, rubber, metal, &c., Universal.....A. D. Gillard
Thermometer.....W. Jandus
Thread-cutting die.....W. Scott
Ticket-case.....P. E. Crabtree
Tide and wave power.....E. Fuchs
Tie-plate.....L. Lebovitz
Tire, Automobile.....C. A. Lieb
Tire, Cushion.....T. Purcell
Tire-mill.....A. W. Carroll
Tire, Non-puncturable.....C. R. Rawdon
Tire-press.....D. McEachern
Tire-protector and tread-grip.....
.....A. C. and S. W. Smith
Tire-pumping attachment for automobiles..
.....O. M. Bergstrom
Tire-rim, Demountable.....A. Paul
Tire, Vehicle.....J. E. Harrison
Tires, Making rubber.....H. Z. Cobb
Toaster, heater, and warmer..F. G. Dupell
Toggle-press, Double-action.....O. Smith
Toilet.....M. E. Connelly
Tongue circles, Truss-rod for buggy.....
.....A. J. Kremlacek
Tool, Combination.....E. Oehrle
Tool-handle.....J. D. Thompson
Tool-holder.....R. B. Levett
Tooth, Artificial.....J. E. Evans
Toy.....R. S. Gilkeson
Toy.....J. Vanderbilt
Toy circus.....C. A. Evans
Toy, Rolling.....C. L. Jones
Traction device, Motor-vehicle.....
.....T. J. Andrews
Tramway system, Weight-actuated-grip single-running-rope.....J. J. A. Miller
Tramways, Bucket operated and supporting grip for single-rope aerial.....
.....J. J. A. Miller
Trap.....J. R. Schuyler
Tray, Coin.....L. I. Bussey et al
Trolley-wheel.....P. F. Morrissey et al
Truck attachment, Car.....A. C. Dennis
Truck, Piano.....L. S. Hubbard
Truss.....H. G. Ballou
Tunnel-kiln for baking pottery.....
.....S. Vincart-Monzin
Turbine, Elastic fluid..2 pats.....
.....R. N. Ehrhart
Turbines, Vane-ring for.....B. Ljungstrom
Twisting and cabling yarns, Means for....
.....J. D. Whyte
Type-arranging device.....A. Hoeberg
Type-writing machine.....F. A. Robinson
Valve, Check.....E. H. Heilig
Valve construction.....A Benner
Valve, Flush.....J. S. Morrissey
Valve mechanism for gate-valves .....
.....G. J. Henry, Jr.
Valve mechanism, Pneumatic.....
.....K. I. Lindstrom
Valve, Tank.....W. N. Long
Vamp-marking machine...E. F. Davenport
Vamp-trimming machine..4 pats.....
.....J. B. Hadaway
Vapor-generator.....R. W. Zierlein
Vegetable-cutter.....D. B. Huffman
Vehicle-brake.....L. Mignault
Vehicle brake and coaster....W. Robinson
Vehicle controller, Motor..G. W. Dunham
Vehicle draft attachment.....C. R. Barr
Vehicle driving-gear, Motor.....W. Baird
Vehicle driving mechanism, Motor.....
.....A. B. Fowler
Vehicle folding top.....J. Teppert
Vehicle running-gear.....E. Roblin
Vehicles, Receiving and delivering apparatus for traveling..H. F. Bittinger et al
Vending-machine.....C. E. Davidson
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Vessel-closure.....J. C. Schleicher
Vessel-top fastener....H. C. J. Scharmann
Vise, Bench.....E. E. Thayer
Wagon, Dump.....A. Woeber
Wall-coating and making same.....
.....R. A. G. Cale
Washboiler.....C. J. Linderholm
Washing and rinsing clothes and the like by means of benzene, Apparatus for....
.....H. Resch
Water-closet seat and cover, Metallic.....
.....F. A. Stephan
Water-elevator, Automatic....A. E. Hodder
Watering-trough.....C. J. Van Ostrand
Watering-trough.....S. Jeffery
Waterproof construction.....B. H. Leather
Weather-strip.....G. Langefeld
Weed and grass destroyer..H. B. Koressel
Weighing mechanism for grocers' bins.....
.....A. H. Thiele
Well-drilling machine.....
.....W. D. Deschamp et al
Wells, Gas-separator for oil..L. W. Brown
Wells, Method and apparatus for cleaning oil.....J. Illy
Wheels, Means for forcing wires into the grooves of.....G. L. Lewis
Whiffletree-hanger.....J. I. Shaw
Wind-instrument tubing...M. M. Rubright
Wind-shield.....A. L. Banker
Window-screen.....F. L. Ricker
Wire-stapling machine.....C. D. Mackay
Wrench.....T. H. Thorne
Wrench.....W. E. Pearce

DESIGNS.

Bedstead-rail.....O. R. Hunt
Brushes or similar articles, Back for.....
.....G. L. Crowell
Glass, Sheet.....C. Jungers
Headlight.....R. H. Welles
Leather.....S. D. Brightman
Pneumatic-cleaning-machine casing.....
.....C. E. Harker
Rug.....W. A. Spring
Rug.....W. G. Reith
Rug.....F. Schindler
Rug.....J. Merry
Rug.....J. H. Witzel
Spoons, forks, or similar articles, Handle for.....G. N. Allen
Table utensil.....J. Laurin
Water-heater.....H. E. Bandlow

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Abrading-machine.....J. M. Nash
Accumulator, Steam regenerative.....
.....E. Eckmann
Acid derivative of bodies of the terpene group, Oleic.....N. Sulzberger
Adding-machine.....J. M. Tourtel
Adhesive substance and preparing same...
.....P. W. Blake
Aerial trucks, Steering mechanism for....
.....E. D. Sands
Aeroplane, Cable-propelled....G. C. Luther
Air-brake apparatus, Cut-out and release for.....S. P. Cota
Air, steam, or hot-water coupling.....
.....G. N. Knapp
Air-washing apparatus.....J. H. Kinealy
Airship, Ocean.....R. Schmiechen
Airship propelling and steering device....
.....E. Honlt
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Alfalfa feed mixture.....E. Gloor et al
Amusement apparatus.....W. S. Van Sant
Ankle-joint for artificial limbs.....
.....J. F. Rowley
Antiskidding-device coupling..P. C. Traver
Antiskidding device for wheel-tires.....
.....P. C. Traver
Antiskidding protector.....G. W. Bierer
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.....G. D. Farnam
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Ball-knocker.....J. B. Oeink
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Barrel.....G. Shields
Barrel-header.....L. Weinman
Bath-spray.....J. J. Lawler
Battery-charging apparatus, Storage.....
.....A. S. Krotz
Battery grid, Storage.....F. M. Michael
Battery-transfer mechanism.....
.....T. V. Buckwalter
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Bed-rest, Invalid's.....O. La Dow
Bed-spring-supporting frame.....M. Sleeth
Bedstead, Invalid.....A. MacDonald
Bell, Signal.....E. P. Gray
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.....T. S. Waller et al
Blowpipe.....R. W. Magna et al
Boat-cover fastening, Life..C. F. Hudgins
Boiler.....H. C. Clay
Boiler-flue cleaner.....A. Connor
Boiler-furnace.....G. de Grahl
Book and type-writer stand, Combined...
.....B. A. Davis
Boring-machine.....J. W. Jones
Bottle-closure.....G. M. Donaldson
Bottle-closure.....C. J. Henry
Bottle filling and capping apparatus.....
.....H. D. Naum
Bottle-filling machine...F. C. Stockel et al
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Bottle, Non-refillable.....C. D. Hudson
Brake.....J. A. Landers
Brake-hanger.....W. H. Kaldrider
Brake-shoe.....W. H. Kaldrider
Briquet-machine.....G. Komarek
Briquets, Manufacture of..E. Trainer et al
Broiler.....W. F. Rape
Brooch.....C. E. Smith
Brooder.....R. J. Lore
Brush.....T. Brantley
Brush-holders and similar devices, Manufacturing parts of.....J. M. Barr
Brush, Scrubbing.....J. L. Pate
Brush, Tooth.....L. Laugh
Brush, Wire.....E. E. Rice
Bulletin-board.....J. M. Johnson
Burning cement and other materials.....
.....P. T. Lindhard
Butter-spade.....R. B. Disbrow
Button, Cuff.....J. Pejchar
Cable-operating drum.....J. N. Anderson
Cableway.....J. J. Fitzgerald
Can-crushing mechanism....M. B. Pickett
Can-heading machine.....C. W. Graham
Can-shipping box.....H. Mayo
Cans and like receptacles, Machine for closing.....C. T. Lack
Cane-loading machine....W. F. Johnstone
Cane-rifle.....H. Tarvardian
Canopy attachment for cots or the like, Collapsible.....A. G. Cole
Car center-bearing.....J. C. Barber
Car construction.....J. B. Heverling
Car-coupling.....C. A. Tower
Car-coupling.....J. Timms
Car-door.....A. G. Lott
Car door, Grain.....W. G. Craig et al
Car door, Grain.....A. C. Smith
Car, Dump.....R. W. Davies
Car-fender.....J. A. Wiedersheim
Car-fender.....O. M. Snyder
Car-tender, Automatic.....A. J. Hagan
Car, Passenger.....C. A. Coons
Car-step, Auxiliary.....L. I. Gregg et al
Car-wheels, Reworking.....J. M. Hansen
Cars, Stake-brace for lumber...I. Tallouse
Cars, Ventilating-cowl for railway.....
.....F. J. Leigh
Carrying system, Elevated..J. N. Anderson
Cartridge, Blasting.....G. M. Peters
Cartridge, Fuel.....T. D. Bauscher
Cash-register.....R. H. Riddle
Casket, Burial.....W. E. Swartz
Casting apparatus.....F. T. Kitchen
Cement-applier.....W. F. Lantenschlager
Cement-block mold.....A. W. Winterfield
Centrifugal separator.....F. R. Abeel
Chuck, Drill.....E. E. Cogswell
Churn.....M. E. Tynes
Cigar-lighter.....F. M. D'Arsi
Cigar-rolling machine.....O. Hammerstein
Circuit-controller.....K. L. Curtis
Circuit-protecting apparatus.....
.....J. E. Graybill
Circuits, Means for neutralizing induced disturbances in intelligence-transmission
.....C. F. Scott
Closet extension, Warming...K. Watanabe
Clothes-line reel.....G. W. Buttles
Clutch or coupling, Frictional...J. Vollmer
Coal and wood box, Combined.....
.....W. B. Quick
Coal-screen.....H. B. Sackett
Coin-changer.....W. H. Staats
Coin-controlled machine.....E. S. Scheble
Color-press and blanker, Sectional.....
.....E. G. Stande
Commutators of dynamos and motors, Machine for grinding.....W. H. Jordan
Concrete burial-caskets, Apparatus for molding.....L. V. Rathbun
Concrete-column mold.....A. L. Thompson
Concrete receptacles, Adjustable frame for making.....H. M. Amos
Concrete roofing-tiles, Devices for making..
.....F. C. Scheiber
Concrete-wall mold.....G. B. Davis et al
Condenser, Surface.....J. W. Pentecost
Condiment-holder.....C. F. Rigby
Conveyer.....M. Sklovsky et al
Cooling-tower.....J. W. Beck
Coop, Poultry.....A. T. Keipper
Cork and bung cutter.....J. Howe
Corn-cutter slitter.....F. W. Smith
Cotton-chopper.....C. W. Weber
Cotton cleaning and separating machine..
.....J. S. Lyle
Cotton opening and ginning machine.....
.....F. J. Manborgne
Cotton-picking machine.....H. J. Stoops
Crate or case, Folding.....A. Braen
Cream-separators, Collecting-casing for....
.....J. and A. Persoons
Creaming and beating machine.....
.....H. M. Bachman
Crumber.....M. L. Poulter
Cryolite, Making artificial...G. Loesekann
Current distributer and timer.....
.....J. M. Smith
Curtain and shade hanger.....
.....E. Hayward et al
Cushion-wheel.....R. E. Boring
Cuspidor.....P. Baro
Dampening-machine.....A. T. Hagen et al
Damper.....N. Pruitt
Dental flask.....D. Folb
Dentist's implement.....H. M. Yorke
Die-press.....N. H. Seelye et al
Digger.....J. K. and E. M. Smith
Digger.....L. Ferris
Display-stand.....F. J. Hughes
Distillation of wood, Separating the products of the destructive.....
.....T. H. Kennedy et al
Door bolt, Double.....A. M. Hoes
Door check and closer.....F. E. Anderson
Door for hotel-entrances and the like.....
.....J. Wendler
Door, Grain.....E. Posson
Door, Metallic.....F. M. Brincherhoff
Door-securer.....C. H. Johnson
Door, Sliding.....O. Richards
Doors, Air-check for sliding.....
.....H. Loughlin, Jr., et al
Dough-mixing machine..F. H. Van Houten
Dough-raiser.....J. C. Grant
Draft-gear.....H. F. Pope
Drawing-board.....G. B. Lambert
Dredging-machine, Universal..T. F. Lonney
Drenching device.....T. N. Jones
Drill-feeding mechanism.....D. S. Waugh
Drill-holder.....J. W. Wells
Drilling mechanism.....W. F. Wittich
Dry cell.....A. N. Barron et al
Dumb-waiter.....C. H. Gray
Dusting-machine.....U. C. Davis
Dye, Azo.....A. Blank et al
Dye, Greenish-yellow.....P. Volkmann
Dynamo.....L. A. Herdt
Educational device.....G. Tuck et al
Educational device.....J. G. Warfield
Elastic wheel.....J. Spyker
Electric-controller plug.....B. F. Gardner
Electric furnace.....J. E. Hewes
Electric machine, Dynamo.....F. C. Hall
Electric machine, Dynamo.....J. L. Davis
Electric switch.....B. C. Webster
Electrical circuits, Protective means for..
.....C. F. Scott
Electrical conductors, Making armored....
.....G. A. Lutz
Electrical controller.....C. E. Bedell
Electrical-distribution system.....
.....F. S. Culver
Electrolier-fixture.....H. F. Hutchinson
Electromagnetic mechanism.....H. Pierson
Elevator safety device...H. W. McNaught
Elevator safety device.....C. B. Norris
Elevators, Cable-hitch for..C. A. Anderson
Embossing mill, Sheet.....V. Chartener
Engine.....A. J. Thompson
Engine muffler, Explosive..A. M. Walstrom
Engine starter, Gas.....F. T. Sweigart
Engine-starting device..P. W. Hodgkinson
Engines, Electric ignition device for internal-combustion.....H. Batt
Escapment mechanism.....O. Eggebrecht
Excavating-machine.....T. F. Lonney
Eyeglasses.....L. F. Adt
Eyeglasses, Finger-piece...E. C. Bernheim
Facing-mold.....N. F. Adamson
Fan, Ventilating.....F. R. Kunkel
Fare-box.....E. S. Buckman et al
Fence.....F. Martin
Fence-making machine, Wire.....
.....G. E. Mirfield
Fifth-wheel.....R. S. Speer
File-case, Automatically-closing..C. F. Fogg
Filter.....F. Turek
Filter.....J. H. Clark
Fire-boat.....C. B. Askew
Fire-escape.....B. Smith
Fire-escape, Portable.....E. P. O'Leary
Fire-pot.....I. G. Huston
Firearm.....L. M. Silva
Fishing-reel.....A. Wollensak
Floor construction.....H. H. Vought, Jr.
Floor-sweep.....F. H. Day
Flour-mill feed-regulator.....G. H. Hottel
Flushing apparatus, Street..W. H. Stewart
Flushing-tank.....G. H. Bailey
Flushing-tank, Automatic.....E. P. Stary
Fly-paper holder.....C. F. Stoner et al
Fly-screen.....M. L. Matheson
Fly-trap.....R. Griswold
Food product.....J. L. Loose
Foot-rest.....F. M. Maley
Fork and shovel, Combination.....
.....H. C. Sumerlin
Formaldehyde, Generating....H. Schneider
Furnace.....M. D. Huff et al
Furnace.....C. A. Carleton
Furnace-director.....M. Green
Furnace-regulator.....A. Stewart
Furnaces, Apparatus for charging the retorts of zinc and other analogous.....
.....E. Dor-Delattre
Furniture, Contouring articles of wooden..
.....W. L. Pfefferkorn et al
Fuse for explosive projectiles..E. Schneider
Galvanizing apparatus.....A. Niedringhaus
Game apparatus.....G. A. O'Neil
Game board, Base-ball..W. C. Tilmes et al
Garment-holder.....B. J. Buckingham
Garment-receptacle.....C. Goldberg
Gas apparatus.....J. H. Taussig
Gas apparatus, Water.....R. M. Searle
Gas from garbage, Manufacture of.....
.....R. Thomas
Gas-mantle support.....G. H. Huston
Gas-producer.....G. J. Hagan
Gas-producer.....E. Jones
Gate.....G. M. West
Gearing, Friction.....W. K. Blackburn
Gin-feed-actuating device.....T. N. Clamp
Glass-drawing machine, Continuous window
.....W. Martin
Glass-making machinery, Die-holder for...
.....T. J. Holden
Glycerin, Treating.....S. H. Fleming
Governor.....W. J. Richards
Grain-drill.....E. G. Radberg
Grain-heater, Sectional.....A. J. Koegler
Grinder.....W. H. Archer
Grinding and sharpening machine.....
.....H. D. Nicholls
Grizzly.....H. A. Corliss
Gum-box.....O. W. Blake
Gum, Chewing.....O. J. Buck
Hair-pin.....H. Morris
Hammer, Boiler-riveting...A. M. Morrison
Harness.....W. D. Beidelman
Harvester.....F. Bossen
Hat-pin guide and hat protector and preserver.....A. P. Rhodes
Hay-press.....G. W. Tucker et al
Head-rest.....J. Denzer
Heater.....C. E. De Forrest
Heater safety device.....I. Filson
Heel-cushion (Reissue).....M. Byrne
High-voltage receptacle and plug.....
.....F. J. Russell
Hopple.....W. E. Sell
Horseshoes, Flask for casting.....
.....L. A. Shaffer
Hose-coupling.....J. H. Hardy
Hose-coupling.....J. H. Stephens
Hose-coupling, Automatic safety.....
.....A. H. Harris
Hot-water heater.....J. C. Meem
Ice-making apparatus.....J. B. Howe
Incubators, Egg-turner for.....
.....H. Hartlieb et al
Indicator or bulletin.....N. E. Barnes
Ingot-stripper.....D. Kendall
Insole for shoes.....H. B. Hemphill
Insulation-applying device.....J. A. Cates
Insulation from conductors, Device for cutting.....E. F. Chytraus
Ironing-board.....O. M. Cline

Ironing-table.....I. Frederick
Irrigating-pipe gate.....H. E. Worley
Jewelry, &c., Machine for drying.....F. P. Boland
Kerosene-burner.....H. Lemp
Key-cutting machine.....C. E. Johnson
Key-opening can, Roll-side....W. E. Taylor
Key-ring.....L. Myers
Knitting-machine needle and jack structure.....E. Tiffany
Labeling machine, Can.....E. S. and B. H. Miller
Lamp-burner.....T. Shearer
Lamp-burner.....C. E. Wirth
Lamp, Self-regulating arc....M. H. Baker
Lamp, Vehicle.....H. W. Beebe
Lamps, Automatic apparatus for lighting and extinguishing gas..N. S. McNab et al
Lamps, Key-socket for electric incandescent.....G. W. Goodridge
Last.....R. Carl
Lead, Making basic sulfate of..A. Hileman
Leather, Manufacturing.....J. T. Smith
Level, Plumb.....H. Platt
Libraries and the like, Controlling apparatus for.....B. Otten
Lifting-jack.....J. B. Runner
Light from hydrocarbons, Process and apparatus for producing.....C. K. Harding
Lightning-arrester.....F. M. Butler
Liquid-motor.....A. F. Krauso
Lock.....H. W. Woodruff
Lock.....C. Vrbsky
Locomotives, Reverse-lever-operating mechanism for.....J. L. McGee
Loom for weaving oriental and other knot-stitch carpets.....C. and A. Renard
Lubricator.....J. Huverstuhl
Lubricator driving mechanism..A. S. Krotz
Machine-driving means.....P. E. Clark
Machine-tool.....C. W. Miles
Magazine.....G. A. Svanberg
Mail-box protector.....E. B. Eggleston
Mail receiving and delivering apparatus..W. T. Ferguson
Mailing-tube.....E. G. Hamilton
Manure-loader, Rotary..E. M. Warrenfeltz
Match-box, Automatic.....C. W. Martin
Mechanical movement....E. G. Eberhardt
Mechanical movement.....J. W. Pitts
Medical treatment, Vapor-generating apparatus for.....J. Lesperance
Metal, Recovering.....A. W. Diack
Metallurgical furnace.....S. Z. de Ferranti
Milker, Mechanical.....L. L. Story
Monolithic construction..2 pats.....E. Sobel et al
Mop-wringer.....W. H. Wetmore
Mortise-lock.....E. B. Rees
Motor.....W. V. Frank
Motor.....I. M. Dotson
Motor-control system.....H. E. White
Motor controller, Electric..R. F. Baerlocker
Motor controller, Electric.....H. L. Beach
Multiplying attachment..P. M. Grandperrin
Music, Automatic leaf-turner for sheet.....J. W. Poince
Music-leaf turner.....E. N. Walter
Music-stand attachment.....A. B. Gruber
Nails and similar articles, Tool for pointing.....G. Bitzer
Necktie-adjusting means..E. W. Bloomfield
Nozzle, Spray.....J. Reade
Nut-lock.....T. E. Stockford
Nut-lock.....A. H. Partridge
Nut-lock.....J. Pillig
Nut-lock.....W. A. Wilt
Nut-lock.....P. P. Jarzick
Nut-lock.....A. M. Lance
Nut-lock.....F. E. Lindhorst
Nut-lock.....J. A. Poirier
Nut-lock.....P. R. Hinkle
Nut-lock, Threadless.....G. W. Bacon
Oil-burner.....C. W. Mitchell
Oscillating motor.....W. V. Frank
Oven door, Baker's.....F. H. Van Houten et al
Oyster-opening machine....F. S. Clarkson
Ozonizer.....O. Linder
Package-filler.....F. Kiely
Packer-platform.....D. Page
Packing-pad.....H. J. Blockl
Packing, Rod.....P. Dorsey
Panel construction.....D. E. Hunter
Paper-bag holder.....D. R. Holmes et al
Paper-clip.....G. W. Hylkema
Paper-cutting-machine cutting-stick.....B. M. Helm
Paper-feed mechanism.....P. J. Meahl
Paper-roll spindles, Locking-chuck for.....D. B. Donnelly
Paper-tube-shaping machine....T. S. Neal
Patch, Repair.....T. Whilde
Pedal.....A. F. and C. H. Norris
Pedal and toe-cap therefor.....A. F. and C. H. Norris
Pen attachment.....A. P. Hamann
Pen, Reservoir.....W. W. Sanford
Pencil-sharpener.....J. Anderson
Perforating or punching machine..J. Weber
Perfume.....C. O. Kleber
Photographic lenses, Shutter-operating apparatus for.....S. Roesner
Piano-pedal extension, Adjustable.....H. C. Stickel
Picture card, Mechanical....J. M. Walcutt
Picture machine, Motion.....F. Knott
Pictures and similar articles, Device for hanging.....S. Rothstein
Piling, Composite.....C. C. Conkling
Pipe-coupling.....J. N. Goodall
Pipe-coupling, Insulated.....S. E. Peeples
Pipe-joint..2 pats.....J. R. Tanner et al
Pipe-puller.....J. Anderson
Pipe-securing means.....D. H. Murphy
Pipes, Roof-collar for vent.....C. L. Holt
Planter.....C. F. Jaynes
Planter-marker.....G. O. Rabeek
Planter, Seed.....C. B. Carter
Plastic material, Making.....W. R. Seigle
Plow.....J. T. Boyd
Plow.....G. A. Knox
Pneumatic cushion, Pocket...C. B. Archer
Pneumatic drill.....R. A. Norling
Pocket, Foot-rule.....A. Wolff
Potato-digger.....W. F. Headland
Powder-box.....W. H. Perkins
Powder holding and dispensing container..M. L. Rhein et al
Power-transmission mechanism.....H. W. Spellman et al
Press-roll.....H. Parker
Pressure-regulator.....J. R. Brown
Primary battery.....E. G. Dodge
Print, Sensitive safety....H. W. F. Lorenz
Printing-press.....H. F. Bochman
Pump.....B. O. Gage
Pump, Liquid-measuring.....A. B. Griffen
Pump, Rotary.....I. B. Humphreys
Pumping cables, Apparatus for cutting well.....G. A. Spang
Punch and knife-blade, Belt..R. L. Shepard
Push-button switch.....C. D. Platt
Puzzle.....W. S. Jenkins
Pyrotechnic compound..B. J. Denver et al
Radius-rod.....H. E. Coffin
Rail-breaking device.....J. Durie
Rail-joint.....L. and W. A. McFadden
Rail-joint.....G. A. Williams
Rail-joint.....B. T. Martinez
Railway-engine for cars and locomotives..J. D. Donovan
Railway-signal-operating apparatus.....W. K. Howe
Railway-tie.....B. F. Campbell
Railway-tie.....M. R. Wharram
Railway-tie and rail-fastening..W. P. Day
Railway-tie, Metallic.....S. A. Wright
Railway-track construction...J. W. Blower
Range attachment, Gas.....M. P. O'Donohoe et al
Ratchet-drill.....T. R. Sheetz
Razor.....A. A. Warner
Razor, Safety.....A. A. Pratt
Reel.....A. Wollensak
Refrigerator drip-alarm device.....E. J. Brophy
Relay, Electrical.....E. E. Clement
Revolving self-cleaning screen.....L. T. Grootenhuis
Rim and tire, Adjustable.....H. C. Smith
Rivers, System to prevent the overflowing of.....J. Bryan
Rolling and seaming machine..P. E. Deaton
Rolling out hollow billets to form seamless tubes.....O. Briede
Rope-knife.....G. A. Sprang
Rotary engine.....G. R. Evans
Rotary explosive-engine.....E. P. Titus
Ruling-machine.....V. Royle
Sad-iron shoe.....C. H. Burk
Safety device.....P. S. Ward
Sage-brush cutter.....R. G. Gose
Sash-fastener.....A. F. Smith
Sausages and the like, Apparatus or device for piercing.....C. H. Whitlock
Saw guiding and feeding device.....G. H. M. Baker
Saw, Swing.....A. P. Wylie
Sawmill-refuse burner.....A. B. Diplock
Scabbard.....B. J. Condon
Scaffold, Window.....A. B. Byrd
Screw-drivers, wrenches, &c., Ratchet mechanism for.....W. B. Lane
Screw-jack.....C. T. Starbuck
Sea-wall or wharf construction.....J. E. Kjilberg
Self-leveling table.....M. Florenz
Separator liner, Centrifugal.....J. and A. Persoons
Sewing-machine for felling....W. Arbetter
Shade fixture, Curtain.....G. D. Hartlett
Shade-holder.....T. Smith
Shaft-coupling.....J. M. Schwab
Shaft, Flexible.....F. Schmidt et al
Shampoo protection device.....J. E. Payne
Shim.....E. G. Lindhe
Shipping box and crate, Folding.....W. E. and C. J. Grazer
Shoe-form.....C. B. Kosters
Sign and signal-lamp, Illuminated.....W. E. Jepson
Signaling system, Alarm....J. E. Shepherd
Silk, Preserving tin-weighted..O. Berg et al
Skirt-marker.....A. H. Lander
Skylight and automatic ventilator, Combined.....C. Saunders
Sled, Disk.....F. E. Chamberlin
Sled, Mechanically-propelled.....H. Day
Snow-melting machine.....O. Muller et al
Soap-dispensing machine.....G. F. Shaver
Socket-shell.....A. S. Lyhne
Spike.....M. Mack
Spinning and twisting frames, Latch for cotton ring.....J. C. Ballard et al
Spirits, Manufacture of purified potable...P. A. Brangier
Spring-motor.....Z. C. Seeders
Spring suspension device, Vehicle.....K. E. Deussen
Springwork.....M. H. Naber
Sprocket-wheel, Sectional.....C. Woolnough et al
Stacker, Hay.....W. H. Sabin
Stay-bolt.....M. Mahoney
Steam-separator.....J. T. Lindstrom
Steel to steel or steel to iron, Attaching..G. Dawson
Steering and controlling device for screw-propelled vessels.....J. P. H. Lund
Sterilizing and oxidizing liquids with ozone, Apparatus for.....A. H. Twombly
Still.....J. Hoffhine et al
Stock-fountain.....A. Moore
Stocking-supporter.....H. E. Petty
Stone, Facing artificial....J. C. Henderson
Stone-marking tool, Pneumatic.....C. S. Felumlee
Stool, Barber's.....J. Davis
Stopper and dropper.....R. L. Larson
Stopping the supply in case of sudden emptying, Automatic apparatus for.....J. A. Bonehaver
Stove attachment.....B. W. Clark
Stove, Heating.....S. S. Cudd
Strainer, Milk.....J. W. Fredrum
Strap-working machine.....J. Thornton
Street-sweeper.....O. L. Neisler
Striking-block and angle-cock holder.....L. A. Hoerr
Stuffing-box.....W. C. Short
Suit-cases and bags, Mechanism for applying corner-pieces to.....S. Crossman
Surgical instrument.....C. Waldvogel
Surveying apparatus.....M. W. Tebyrica
Switch-operating apparatus.....F. Schad
Switch-throwing device.....P. H. Petersen
Switches, Control of electrically-operated..H. E. White
Switches, Control of electrically-operated..H. E. White
Switches, Control of electrically-operated..H. E. White
Switching apparatus, Electric..S. T. Hutton
Switching device, Electrical.....J. G. Meredith
Tag, Shipping.....G. Richberger
Talking-machine.....M. O. Arnold
Tampon.....L. G. Langstaff
Tap, Pressure.....C. L. Ferman
Target.....O. Horsrud
Telegraph, Printing.....A. C. Crehore
Telephone and protective alarm system, Combined.....J. G. Nolen
Telephone-line-wire detacher.....J. K. Tomlinson
Telephone-receiver holder....C. R. Phillips
Time-recorder.....W. D. Hawley
Tire.....L. M. Nelson
Tire, Auto.....F. Modlin
Tire-locking device, Vehicle....A. Packard
Tire tread, Detachable automobile..2 pats.....H. M. Pittman
Toaster, Bread.....A. A. Hill
Tobacco-box fasteuing.....P. F. and A. E. MaGee
Toilet article (Reissue)..J. A. We Stewart
Tongs, Bag.....A. Holsey
Tongue-switch.....C. A. Alden
Tool for finishing bearings.....T. M. Boggs
Top-spinner.....E. Friz
Toy.....S. S. Pete
Track and supporting-boom therefor, Swinging.....H. L. and H. J. Ferris
Track-switch, Electrically-operated.....F. B. Corey
Trammel.....A. B. Cooper
Trap.....C. C. Humberstone
Trolley-shifter.....S. L. Hanson
Trousers.....A. Leander
Truck for hay-loaders..W. C. F. Blossfield
Tube-cutter.....W. A. and C. E. Altman
Turbine.....R. Kostanjevic et al
Turbine-balancing means.....E. Thomson
Turbine-blading machine..S. Z. de Ferranti
Turbine, Elastic-fluid.....C. G. Curtis
Turbine, Gas.....S. A. Moss
Turbine-governing mechanism..R. H. Rice
Turbines, Leakage-reducing means for....F. R. C. Boyd
Turret-machine.....A. W. Wigglesworth
Type-writer attachment.....F. C. Shobert
Type-writing machine.....J. H. Barr
Type-writing machine.....T. J. Knapp
Vacuum-cleaner.....G. Backer
Valve.....T. Turner
Valve, Automatic fluid-pressure-retaining..C. W. Hurl
Valve device, Triple.....W. V. Turner
Valve, Needle.....A. P. Storrs
Valve-operating mechanism for presses....J. R. Browning
Vapor rectifier, Mercury.....F. Conrad
Vapor rectifiers, Automatic starting device for mercury.....F. S. Chapman
Vegetables, Scalding and washing.....G. E. Wright
Vehicle-body.....S. E. Light
Vehicle draft appliance.....W. P. Maxwell
Vehicle-wheel.....T. W. Baker
Vehicle-wheel.....J. Illingworth
Vehicle-wheel, Resilient.....J. Gaynor
Vending apparatus.....I. F. Harris
Vending-machine.....P. S. Bloch
Vending-machine.....J. M. Thornber
Vending machine, Bottle.....J. B. Clay
Vending-machines, Coin-operated delivering and fraud-preventing mechanism for....A. D. Grover
Ventilator.....C. McVeety
Vise, Bench.....A. W. Peterson
Wagon, Dumping..2 pats.....H. D. Ells
Wagon-standard.....A. D. Stierheim
Wall construction, Composite.....R. H. Robinson
Wall-stirrup.....P. Kosack
Walls or ceilings, Composition of matter used as an interior finish for.....W. H. Whitney, Jr., et al
Warp-linking machine.....G. B. Cocker
Washing-machine dolly....R. B. Goodrich
Washstand.....L. J. Hoffman
Watchcase.....E. J. Wittnauer
Watchcase.....J. K. Worrell
Water-closets, urinals, &c., Apparatus for the automatic delivery of disinfectants to the flushing-water of.....A. E. Smith
Water-column spout.....F. C. Anderson
Water-elevating apparatus.....O. A. Reed
Water-gage.....H. Boushear
Water-meter.....J. P. Kelly
Water regulator and surface blow-off, Automatic.....D. M. Maxon
Wave-motor.....E. E. Shinn
Wheel.....E. E. Thomas
Whiffletree.....D. Hurd
Wind-motor.....W. A. Williams
Windmill.....J. A. Carlson
Windmill-regulator.....L. S. and A. W. Hagerman
Winding-shafts, Stop-collar for.....E. T. Gowing
Wire-bending machine..A. H. Nilson et al
Wire-clamping mechanism..E. Lewis et al
Wire-fastener.....G. C. Wilkison
Woodworking-machine guard.....L. J. Halverstadt
Wrench.....F. A. Rademacher
Wrench.....G. W. Jessup, Jr.
Writing machine, Draft.....H. C. Hartley

DESIGNS.

Carpet.....J. B. Moffat
Card-case or similar article.....E. R. Sheppard
Carpet.....W. M. Morton
Coin-holder and vinaigrette...S. O. Bigney
Lifting-jack standard and casing.....E. K. Conover
Locket and vinaigrette.....S. O. Bigney
Plate, China.....C. J. Ahrenfeldt
Rubber binding for matting ends or similar articles.....C. H. Oakley
Rug.....C. Forrester
Rug.....W. G. Reith
Rug.....E. G. Sauer
Rug.....W. A. Spring
Rug.....J. H. Witzel
Sewing-stand.....L. B. Laridon
Shrine.....F. H. McCann
Type, Font of.....W. E. Elcome

Issued September 13, 1910.

MECHANICAL PATENTS.

Absorber.....N. H. Hiller
Acid, Making formic.....W. H. Walker
Advertising-card.....C. F. Alsop
Advertising device.....T. J. Burke
Aeroplane.....A. A. Heil
Air-brake system.....O. Johnson
Air, Extracting moisture from...J. Gayley
Airship-controlling device..A. von Parseval
Alarms, Circuit-closer for....F. A. Schultz
Alloys and the separation of metals, Producing.....P. F. Cowing
Amalgam, Making liquid sodium.....H. P. Ewell
Aminoacetylpyrocatechin, Producing.....W. Gruttefien
Aminoacidylpyrocatechin and making same.....W. Gruettefien
Ammonia from coal gasses and the like, Recovering.....J. A. Roelofsen
Ammonia-saturator.....J. A. Roelofsen
Andirons and fender.....M. B. and J. K. Heller
Anthracene compound and making same...F. Kacer
Automobile-fender.....G. E. Coney
Automobile-radiator.....C. G. Boeck
Automobile shock-absorber..C. A. Petersen
Automobile sled.....O. A. Arnet
Automobile sled attachment...W. E. Ryan
Automobiles, &c., Protector for.....S. C. Partington
Bag-holder.....J. E. and C. Sapp
Bait, Artificial.....C. Grove
Bales or packages, Tying device for hay...W. H. Leavitt
Barrel-hoop.....F. X. Pfluger
Bearing, Ball.....W. Sonnberg
Bed, Hospital or invalid's.....J. G. Segesman et al
Beer-case attachment.....G. C. Kerkow
Belt-tightener.....J. G. Martin
Bib-relief, Safety compression.....J. J. Divekey
Bicycle-support.....J. P. Taylor
Billiard-cue.....O. D. Bloom et al
Binder.....E. A. Trussell
Binder, Leaf.....H. G. Buchan
Binding-post.....T. E. Murray
Bit-brace.....W. H. Whigham
Blasting-barrel.....E. R. Harkins
Blower-actuating means.....H. Walter
Boat, Submarine.....S. Lake
Boat, Submarine torpedo.....A. M. Fuller
Book and file case, Revolving.....T. H. Knight
Book-stack.....R. O. Wheeler
Boot and shoe tree.....C. A. Batchelder
Boot-black stand.....E. W. Purves
Boring-tools, Angle guide attachment for..W. H. Whigham
Bottle, Antirefillable.....J. H. Quinn
Bottle-closure.....F. E. Joselin
Bottle, Non-refillable.....J. F. McGrane
Brake-beam.....B. Haskell
Bridle-bit.....M. D. and A. Q. Moss
Buckle.....W. A. Holden
Buckle and strap loop.....F. Conway
Buoy, Mooring.....W. P. Jordan
Burner for fire-pots, blow-torches, and the like.....E. Beyer
Butter-cutting tool.....C. Glaus
Buttonhole, Imitation.....C. McNeil
Cabinet, Kitchen.....G. W. Drnliner
Cabinet-terminal, Sleeve.....R. S. Donaldson et al
Cake machine, Wire-cut soft..T. L. Green
Calcining-kiln.....W. J. Willis
Calculating-machine.....E. H. Palmer
Calculator.....G. W. Goss
Calculator, Recording.....J. Mallman
Camera-finder.....G. F. Hammond
Can-cleaning machine.....C. W. Graham
Can-opener.....E. W. Bishop
Can-opener.....H. G. Hill
Canning green corn.....A. J. Judge
Candle-holder.....H. Berg
Capsule, Metal....C. W. V. Messerschmidt
Car and brake wheel, Combined.....C. A. Lindstrom
Car-coupling.....W. F. Richards
Car-door.....B. D. Jones
Car-door.....F. Ward et al
Car, Passenger.....S. T. Bole
Car, Railway.....A. Hansen
Car-roof.....P. H. Murphy
Car safety device, Railway..W. S. Jackson
Car underframe, Railway.....C. S. Shallenberger
Car-wheel, Noiseless.....P. P. Cookingham
Cars, Bolster construction for railway....2 pats .....J. R. Carmer
Carbureter.....F. J. Cox
Carbureter for internal-combustion engines.....F. R. Davis
Carbureting apparatus.....F. Ostermayer
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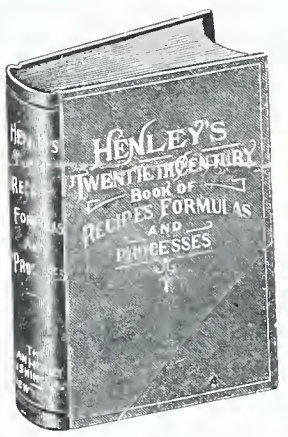

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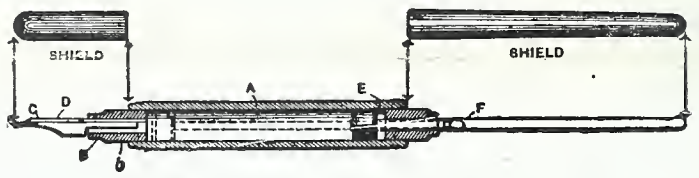

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